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NOTE

Symbols used

The following symbols are used in tables where appropriate :

- . nil or negligible
- .. not applicable
- not available

FOREWORD

Brij Pal Singh's study, Educational Progress and Economic Development in Punjab, is the second project to be completed by our University's Punjab Economy Research Unit, subsequently converted into Centre for Economic and Social Research. The first project was a study of the consumption pattern in the Punjab, carried out by Shri Haramol Singh. The findings of this project were published, in abbreviated form, in the *Economic and Political Weekly*, Bombay (December 11, 1971).

The present project was completed by the middle of 1972 but, for certain reasons, its publication was held up. A summary of its findings was, however, published in *The Times of India* of October 5, 1973, which attracted an editorial from *The Economic Times* of October 12, 1973, and numerous letters from educational institutions and individuals.

The project was carried out under my supervision and, as desired by the Syndicate of the Punjabi University, I have looked through the text and done some editing. In this connection I have to mention that, while I agree with the main conclusions of this report, namely (i) that the educational system in Punjab is largely unproductive, (ii) that it carries a considerable amount of miseducation and misdirection of resources, and (iii) that it has created an excess capacity which can be utilized at a marginal cost for further development of the system, I cannot identify myself entirely with its reasoning, though I do appreciate and respect the author's point of view.

Department of Economics
Punjabi University, Patiala
April 13, 1974

H. K. Manmohan Singh
Professor and Head

INTRODUCTION

“The destiny of India is now being shaped in her classrooms”. The Education Commission opened its report entitled *Education and National Development* with these words. The Punjab Government's Memorandum submitted to the Fifth Finance Commission, in its opening sentence in the chapter on “Social Services”. said : “From the point of view of return, investment in education is, perhaps, the best investment any country can make.”

But after a study of the progress of education in Punjab the conclusion seems inescapable that education has contributed little to the recent economic development of the state. Our main thesis is that the content of education is much more important than the linear growth of the system. All schooling is not investment. Proper education, in a proper socio-economic setting and combined with a judicious amount of physical capital formation, can certainly help speed up economic growth. This is far from the usual labeling of education as investment in human beings.

While capital is scarce in Punjab, there is an excess capacity in certain types of education. The suggestion is to halt the growth of more institutions of the usual type, restructure the educational system to serve economic development and, in the short run, to concentrate on functional adult education and reorientation and retraining of the labour force.

The study has extensively used the official data gathered from various sources. I am particularly grateful to Shri V. P. Sharma, Director Statistical Bureau, for extending help and making official data available whenever required. Shri M. M. Bhardwaj, Joint Director (Evaluation), Economic and Statistical Organisation, has similarly extended the maximum cooperation. My thanks are also due to Shri K. K. Verma, Research Officer, State Income Section, of the above Organisation; Mr. Bangur of National Sample Survey, Punjab; Statistical Officer, Punjab Education Department and his colleagues, and District Education Officer, Ludhiana, for help and cooperation in allowing access to official data.

The study was conducted as a part of my official duties in the Punjab Economy Research Unit of the Punjabi University, Patiala, under the direction and guidance of Dr H. K. Manmohan Singh, Professor and Head, Department of Economics, of the University to whom I am deeply indebted. In fact, he is the initiator and promotor of this project and has done much in getting it through.

My thanks are due to Shri Jagat Jit Singh of the Punjabi University Library who prepared the index. I am also thankful to Shri Piara Singh who spared no effort in getting the work typed in time for the press.

Department of Economics
Punjabi University, Patiala
April 10, 1974

BRIJ PAL SINGH

CHAPTER I

EDUCATION IN OLD PUNJAB

Punjab, historically speaking, has experienced many vicissitudes which have changed its body and shape so that the word 'Punjab'—meaning the land of five rivers—has since long been a misnomer, if one were a strict definitionist. The last reorganisation of Punjab took place on November 1, 1966. By the term 'old Punjab' we therefore mean the state as it existed immediately before the 1966 reorganisation.

According to the 1961 Census, Punjab comprised an area of 1,22,517 square kilometres and had a population of 2,03,06,812 consisting of 1,08,91,576 males and 94,15,236 females. The density of population stood at 166 persons per square kilometre and the sex ratio came to 864 females per 1000 males.

Earlier to the 1966 reorganisation, the territory of Punjab was divided into two linguistic regions, the Punjabi-speaking and the Hindi-speaking. This was for political and administrative reasons and is of relevance to the present study as later on, in 1966, Punjab was actually bifurcated into two independent states of Punjab and Haryana on the basis of language.¹ Of the two linguistic regions, the Punjabi-speaking region was comparatively a smaller part (51,751 square kilometres) but had a larger population (1,15,21,439 persons). The density of population in this region was also higher, 233 as against 124 in the Hindi-speaking region. Similarly the literacy figure (27.1) for the Punjabi-speaking region was higher than the corresponding figure (20.1) for the Hindi-speaking region, the total for Punjab being 24.2 taken as a percentage of the total population of the state.

Paradoxically, the first conscious effort for development of education in Punjab came in the wake of an attempt to relieve

1. As a part of this reorganisation, some territory was transferred to Himachal Pradesh as well.

the incidence of unemployment among the educated. This was towards the middle of the First Five Year Plan when the state government took up some Centrally-sponsored schemes for expansion of elementary education as a result of which 7,200 persons gained employment as teachers.² This point is of considerable theoretical interest as over years the impression has grown that the main cause of unemployment among the educated in the state is a relatively high rate of expansion of education. Whatever the driving impulse, the fact stands that education in Punjab has grown at an enormous pace since the process began in the middle of the First Five Year Plan.

Measuring the level and rate of development of education is not an easy task. Gunnar Myrdal, the Swedish economist and sociologist, dismisses any single indicator as adequate. The traditional approach in terms of expenditure incurred is regarded by him as 'misplaced aggregation'.³ Although, a common denominator for indicating conditions of education is not possible, a general idea can be had by taking the various indicators into consideration together.

Table 1.1 gives the number of institutions, scholars and teachers in these institutions for the state of Punjab during the period 1960-61 to 1963-64.

The position regarding the total expenditure on recognised institutions of all kinds taken together for the years 1960-61 to 1963-64 emerges as follows :

TABLE 1.2
EXPENDITURE ON RECOGNISED INSTITUTIONS
OF ALL KINDS

Item	1960-61	1961-62	1962-63	1963-64
1. Total expenditure (Thousands of rupees)	1,88,311	2,15,311	2,01,150	2,36,439
2. Total number of scholars	21,55,685	27,31,882	29,12,298	30,32,411
3. Expenditure per scholar (Rupees)	87.4	78.8	78.9	77.9

Source : Statistical Abstract of Punjab 1965.

2. Government of Punjab, *Study of Impact of Plan Programmes*, p. 36.

3. Gunnar Myrdal, *Asian Drama*, pp. 1535-36.

Type of inst	1963-64			
	Number of teachers	Number	Number of scholars	Number of teachers
1. Universities	290	4	2,759	368
2. Arts and sci colleges		100	46,644	4,172
3. Professional technical col	2,964	47	13,324	
4. Colleges of education		6	775	
5. Post basic sc	54	2	2,689	89
6. High and hi secondary sc	27,233	1,564	9,53,139	29,572
7. Middle scho	13,617	1,598	4,67,912	14,930
8. Primary sch	32,924	12,641	15,11,545	34,816
9. Pre-primary schools	19	10	430	21
10. Schools of v and technica	1,934	67	12,735	956
11. Schools of s education	649	1,117	20,449	494
TOTAL	80,674	17,156	30,32,411	85,418

The trend in government expenditure on public institutions and grants-in-aid to recognised institutions, that is expenditure under the budget head '28-education' which pertains only to general education, is as follows :

TABLE 1.3
GOVERNMENT EXPENDITURE ON GENERAL
EDUCATION

	(Lakhs of rupees)			
	1960-61	1961-62	1962-63	1963-64
1. Primary education	381.57	415.36	466.03	527.07
2. Secondary education	476.82	545.52	625.88	662.59
3. College education	114.23	139.60	132.45	118.04
TOTAL	972.62	1,100.48	1,224.36	1,307.70

Source : Statistical Abstract of Punjab 1965.

TABLE 1.4
GOVERNMENT EXPENDITURE ON
GENERAL EDUCATION

	(Lakhs of rupees)		
	1964-65 (accounts)	1965-66 (revised estimates)	1966-67 (budget estimates)
1. Primary education	544.48	635.55	701.23
2. Secondary education	710.76	993.89	1,129.12
3. College and university education	155.65	166.63	207.87
TOTAL	1,410.89	1,796.97	2,038.22

Source : Budget of the Punjab Government for the
year 1966-67.

As is evident from the figures of expenditure on general education, the major share is taken up by secondary education

which accounts for 50.55 per cent of the total expenditure. Primary education gets 35-40 per cent of the funds and secondary and college education together get about 60 per cent of the funds. The pattern of division of the total funds during 1960-61 and 1966-67 has stayed almost the same.

Another index of the level of education is the percentage of students in different age-groups receiving education in recognised institutions. Harbison and Myers attach great importance to these percentage enrollment figures. In fact their composite index, which ranks 75 countries in terms of levels of human-resource development, is simply the arithmetic total of percentage enrollment at second level of education and percentage enrollment at the third level multiplied by a weight of 5.⁴ Unfortunately the information available for Punjab relates only to general education and is tabulated as below :

TABLE 1.5
PERCENTAGE ENROLLMENT

	Age-groups					
	Boys			Girls		
	5-11	11-14	14 and above	5-11	11-14	14 and above
1960-61	69.0	50.7	22.4	36.9	14.2	5.2
1961-62	81.3	46.2	21.5	50.9	14.4	5.4
1962-63	84.8	47.4	20.7	51.9	16.9	6.2
1963-64	86.2	44.8	21.9	54.1	17.2	6.9

Source : Statistical Abstract of Punjab 1966.

We do not have separate data for enrollment percentages above the age of 14. Harbison and Myers take second level education as drawn out from the age-group 15-19 and third level education as drawn out from the age-group 20-24.

4. Fredrick Harbison and Charles A. Myers, *Education, Manpower, and Economic Growth*, pp. 31-32.

Using the enrollment ratios for the age-groups 11-14 (middle classes) and 14 and above (high and higher secondary classes), a modified composite index can be defined as

$$I_1 = m + 5h$$

where m is the percentage of male students in the age-group 11-14 and h is the percentage of male students in the age-group 14 and above. Now for the year 1963-64 the modified composite index for the old Punjab works out as

$$\begin{aligned} I_1 &= 44.8 + 5 \times 21.9 \\ &= 44.8 + 109.5 \\ &= 154.3 \end{aligned}$$

Harbison and Myers's average composite index for the 16 countries classified as "advanced" came to 115.

The other three indicators used by Harbison and Myers are : GNP per capita; percentage of active population in agriculture; and number of teachers (first and second levels) per ten thousand population. We may take the second and third indicators first, in that order. According to the 1961 Census, the total working population of old Punjab in 1961 was 71,01,146. Of this, 45,40,526 persons were classified as cultivators and agricultural labourers which constitutes 63.94 per cent of the total working population of the state. This indicates "level 2" which corresponds to Harbison and Myers's notion of "a partially developed state".

The total population of old Punjab in 1961 was 2,03,06,812. The decennial (1961-71) rate of growth of population of reorganised Punjab has been estimated as 2.10 per cent and of Haryana as 3.14 per cent. Taking the average rate of growth of 2.62 per cent for old Punjab, the population in 1963-64 can be taken as an average of the population during 1963 and 1964. This comes out to 2,21,68,996. The strength of first and second level teachers in old Punjab during the academic year 1963-64 was 60,860. Thus the number of teachers per ten thousand population works out to 27.45.

Regarding the first indicator, the figures are available for the net product of the state and per capita income. These are as follows :

TABLE 1.6
STATE INCOME AND PER CAPITA INCOME

	(At current prices)			
	1960-61	1961-62	1962-63	1963-64
Net output (Crores of rupees)	779.8	825.8	877.8	1,403.4
Per capita net output (Rupees)	388	401	416	483

As the figures of total expenditure on recognised institutions are available (Table 1.2), the expenditure on education as percentage of state income can easily be calculated (Table 1.7).

TABLE 1.7
PERCENTAGE EXPENDITURE ON EDUCATION

	1960-61	1961-62	1962-63	1963-64
Total expenditure on education as percentage of state income	2.41	2.61	2.29	1.68

It is readily seen from the above table that expenditure as a ratio of state income, for all types of education, continually declined during the period 1960-61 to 1963-64. This is contrary to the widely held belief which takes into account only general education.

It would be interesting to find out where Punjab stands using the Harbison-Myers criteria of classification. The average values of the indicators are given for the different categories of the countries considered by Harbison and Myers as well as for Punjab.

TABLE 1.8
INDICATORS OF ECONOMIC DEVELOPMENT AND EDUCATIONAL DEVELOPMENT

	Level 1 (under- developed) 17 countries	Level 2 (partially developed) 21 countries	Level 3 (semi- developed) 21 countries	Level 4 (advanced) 16 countries	PUNJAB (1963-64)
1. GNP per capita (US dollars)	84	182	380	1,100	101* (Net output per capita)
2. Percentage of active population in agriculture	83	65	52	23	64 (in 1961)
3. Composite index	3	21	50	115	154 (modified)
4. Number of first and second level teachers per ten thousand population	117	38	53	83	27
5. Public expenditure on education as percentage of national income	3.7	2.1	3.1	4.2	1.68

* According to the pre-devaluation rate of exchange.

On the basis of the indicators of economic development, Punjab appears to be a partially developed state. However when we come to the indicators of level of education, the position is uncertain. First, we do not have the composite index for Punjab on which so much reliance is placed by Harbison and Myers. Secondly, public expenditure on education as percentage of national income indicates only the level of financial allocation made to education. This leaves us with the indicator of the number of teachers per ten thousand population. On this basis too, Punjab's place is between level 1 and level 2.

The analysis presented in this chapter is an attempt to indicate only in a general way the level and pace of development of education in the state of Punjab as it existed before 1966. Trying to read too much into the figures would appear contrived and no attempt has therefore been made to draw any policy conclusions. No meaningful causal relationship can be established among the indicators that have been used. All of them admit of alternative interpretations. Least of all they tell anything about the policy implications. Enrollment ratios are flow ratios which create a stock of educated people after a long time and cannot explain the level of state income. On the other hand, a rising state income can induce people to increase their expenditure on education as on other consumption services.

CHAPTER II

EDUCATION AND ECONOMIC DEVELOPMENT

The meaning and significance of education are intimately connected to what we expect to get out of it. Our expectations in turn form our philosophy of life and our aims and aspirations. To many persons, education means enrichment of life, enlightenment for the ignorant or "providing the individuals with the opportunity to express their personalities."¹

Education is also regarded as a "process of training, of imparting skills and aptitudes, of enabling a man to serve his community and to derive from it in return the support and the sustenance which he needs."²

The common factor in all these approaches is that education is an activity of learning. Although learning can be self-learning, yet generally it requires teaching. Thus Machlup defines education as an activity of learning "where learning is aided by teaching—that is where there are systematic efforts to disseminate knowledge by way of instruction."³

The process of learning is widely diffused, the main sources being :

- (a) Education at home;
- (b) Education in schools and colleges;
- (c) Training through experience in the job;
- (d) Training in the armed services; and
- (e) Education through television and radio.

-
1. L. K. Jha, "Education and Economic Development," *Reserve Bank of India Bulletin*, April 1970.
 2. *Ibid.*
 3. F. Machlup, *Production and Distribution of Knowledge in the United States*, p. 51.

To this list C.K. Rowley adds :

- (f) Training by religious organisations such as church, temple, mosque and gurdwara; and
- (g) Self-education.⁴

One can of course enlarge the list to include learning through trade unions, political organisations and such like media, and even shops and industrial establishments. This is clearly too wide a list. In the ultimate analysis the learning process runs throughout one's life and wherever one goes. The real question is the relative significance of the various sources of learning.

For purposes of this study education is taken to mean learning that is imparted through organised educational institutions and recognised by the government as such. This approach is operational and does not involve us in making any value judgements with regard to the aims of education. It is not implied that education has no clear aims. On the contrary, the study seeks to analyse the specific contribution that education can make to an economy in terms of increased productivity or enhanced economic development. Of the several indicators of economic development, per capita income is the commonest and has been employed for this purpose but we shall be supplementing it with other indicators where necessary.

The main questions are : How are education and economic development mutually related ? Which is the cause and which is the effect ? Can we quantify this cause and effect relationship ? Does this relationship enable us to make predictions relevant to educational policy and its impact on economic development ?

That education is a consumption good in the nature of a service is fairly obvious. This value-in-use or direct satisfaction aspect of education has been emphasized since ages. Many a time education has been taken to mean the enjoyment of life itself. The right to education was given an important place in the Universal Declaration of Human Rights. Article 26 reads :

Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be

4. C.K. Rowley, "The Political Economy of British Education", *Scottish Journal of Political Economy*, June 1969, p. 162.

compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

The Declaration of the Rights of the Child proclaimed by the General Assembly on 20th November, 1959 states :

The child is to receive education which shall be free and compulsory, at least in the elementary stages. He shall be given an education which will promote his general culture and enable him, on a basis of equal opportunity, to develop his abilities, his individual judgement and his sense of moral and social responsibility to become a useful member of society.

The assertion of these rights is recognition of what Gunnar Myrdal calls "independent value" of education. In fact no body has ever denied the consumption value of education although differences have often arisen over the emphasis to be placed on it. According to John Vaizey. "Education, quite demonstrably, is consumption whatever else it may be".⁵

Similarly Musgrave while recognising the consumption aspect of education divides it into two parts : current consumption—the delights of attending school; and future consumption—the ability of enjoyment of fuller future life permitted by education. But he takes the consumption aspect as of less importance in the belief that the future consumption is comparatively of greater significance and that the enhanced future ability to appreciate life makes education a consumer durable which can be considered as an investment capable of generating a flow of imputed incomes.⁶ The fallacy in this argument is at once obvious. If we generalise the hypothesis that all future consumption of education is investment and begin to define 'future', we shall be led to the awkward conclusion that not only education but all consumption is investment.

5. John Vaizey, "Towards a New Political Economy ?" *The Residual Factor and Economic Growth*, OECD, p. 208

6. Richard A. Musgrave, "Notes on Educational Investment in Developing Nations", *Financing of Education for Economic Growth*, OECD, p. 32,

It would, therefore, be proper to distinguish clearly the two aspects of education on the plane of analysis even though if it were not so easy empirically. What is the practical value of this distinction? Education may be fruitful, worth spending millions of rupees on, even if it were yielding nothing as an investment good. The importance of art, literature, music, education and religion may seem a bit exaggerated in an age in which the economic problem has emerged as the most pressing problem. But if one were to take a perspective view and look ahead to future times, surely the independent value of education cannot be minimised.⁷ Therefore while we shall be concerned most of our time with education as an investment good, it is well to bear in mind the value of education for its own sake.

The concept of the 'instrumental value' of education, that is its productivity-raising aspect, is not altogether new. Xenophon explains, in his *Lacedaemonian Constitution*, the way the Spartans planned their education to respond to their definite economic and other objectives. Plato's *Republic* contains an elaborate programme of education for clearly defined political aims. Adam Smith, in his *The Wealth of Nations*, gave education a prominent place in enhancing productivity through division of labour. Von Thunen complained that a hundred human beings might be sacrificed in battle in order to save one canon with a capital value twenty times less than the capital value of a human being.⁸ Alfred Marshall, the great Cambridge economist, talking of industrial training in his *Principles of Economics*, stated unequivocally:

But a good education confers great indirect benefits even on the ordinary work-man. It stimulates his mental activity; it fosters in him a habit of wise inquisitiveness; it makes him more intelligent, more ready, more trust-worthy in his ordinary work; it raises the tone of his life in working hours and out of working hours; it is thus an important means towards the production of material wealth.⁹

7. Cf. *Essays in Persuasion*, John Maynard Keynes, pp. 365-73.

8. B. F. Kiker, "Von Thunen on Human Capital", *Oxford Economic Papers*, (New series), November 1969.

9. Alfred Marshall, *Principles of Economics*, pp. 175-76. A modern economist specialising in Economics of Education might like to underline the

(Cont.)

Even the critics of the modern capital approach to education have not denied that education confers visible material benefits on an individual and the society in terms of increased skills and productivity and can be regarded both as consumption and investment. The real difficulty however appears when some economists think of education only as consumption and the others think of education only as investment (and try to calculate the economic rate of return on it—the so-called cost benefit approach).

Because of the difficulties inherent in a problem like this, with the concept of calculation of quantitative returns being certainly a pioneering effort and the so-called investment being not just investment alone, alternative theoretical approaches are bound to be developed. And this has been the case with the analysis of education. W.G. Bowen has offered three possible reasons for the variety of approaches that have been developed: the inventiveness of the economists; the complexity of the problem; and "the fact that we simply don't know as yet how best to proceed."¹⁰

Broadly speaking the different approaches can be grouped into four categories :

- (a) the correlation approach;
- (b) the residual approach;
- (c) the forecasting-manpower-needs approach; and
- (d) the rate of return approach.

Of these, the fourth is the one that has captured imagination. A brief discussion of these approaches seems to be called for.*

concluding part of the quotation. Marshall himself would have preferred perhaps underscoring the word 'indirect' but we believe the most important word is the adjective 'good' that qualifies the word 'education'.

10. W.G. Bowen, "Assessing the Economic Contribution of Education", *Economics of Education*, M. Blaug (ed.), P.67.

*The discussion of different approaches is based on the following sources :

- a. W. G. Bowen, "Assessing the Economic Contribution of Education : an Appraisal of Alternative Approaches", *Higher Education. Report of the Committee under the Chairmanship of Lord Robbins 1961-63, Appendix Four*.
- b. A.M. Nalla Gounden, *Education and Economic Development*, Appendix I (unpublished Ph. D. thesis presented to Kurukshetra University, Kurukshetra).
- c. H. N. Pandit, "Economic Approaches to Investment Decision-making in Education", *Indian Educational Review*, January 1970.

The Correlation Approach

This is the simplest approach to view educational and economic progress together. Through simple techniques of statistical correlation, some specific index of educational activity is related to some other specific indicator of economic activity. The choice of the index depends on the preferences of the particular researcher and the availability of data, but the most widely used indices of educational activity are the ratio of literate or highly qualified manpower to total population, enrollment ratios for specific age-groups, per capita expenditure on education and percentage of national income spent on education. The generally used indices of economic activity are national income per capita, ratio of population dependent on particular economic activity or occupational distribution of the working force.

The correlation approach can be applied to cross-sectional as well as historical data. Thus a changing situation in one country or a region can be viewed over a period of time or one can make inter-regional or international comparisons at a certain point of time.

Svennilson, Edding and Elvin applied this approach to cross-sectional data of 22 advanced countries. The indicators used were the enrollment ratios on the side of education and GNP per capita on the side of economic activity. Their finding was a positive correlation.¹¹

Harbison and Myers working with cross-sectional data of 75 countries used a "composite index of levels of human resource development" comprising the enrollment percentage at the second level of education and the enrollment percentage at the third level of education. They used two separate indicators of the level of economic development, namely, GNP per capita and the percentage of active population engaged in agricultural occupations. They found out a positive correlation between the composite index and the GNP per capita but a negative correlation between the composite index and the ratio of active population in agriculture.¹²

These comparisons of educational activity and economic activity are not conclusive. M.J. Bowman and Arnold Anderson have reported: "Correlations of literacy rates with income were

11. OECD, *Policy Conference on Economic Growth and Investment in Education*, pp. 53-97.

12. Frederick Harbison and Charles A. Myers, *Education, Manpower, and Economic Growth*, pp. 23-48.

very loose and nonlinear". Again, excluding countries with 90 per cent or more literacy during 1950-54, the post-primary enrollment rates added virtually nothing to the correlation between 1950-54 literacy and 1955 per capita incomes. The zero order correlation gave an r of .43 and adding post-primary enrollment rates raised it to only .44.¹³

Daniel Blot and Michel Debeauvais have tried to establish correlation between public expenditure on education and GDP using 1961 data for 104 countries. r^2 turned out to be .933.¹⁴ An earlier study of data of 94 countries in 1960 had also yielded the same result.

H. Correa analysed the data for 48 countries. He compared enrollments in the age-group 5-14 with the per capita income of the respective countries. His coefficient of correlation came out to be .617.¹⁵

This approach is all right as a general comparison of educational activity with the level of economic growth. It has the merit of being simple though it gives only a rough idea. In cross-sectional data of many countries it sets the educational achievements of one or more countries against the background of other countries. It is simple to calculate and data for this purpose are more easily available, especially in underdeveloped countries.

But one should not expect too much from it either. The most important point to note is that the correlation, high or low, significant or non-significant, does not establish a causal relationship. The high correlation may be due to some other factor(s) influencing the two variables being correlated. Even when you do assume a causal relationship between the two, it is too difficult to decide which is the cause and which is the effect. For example Mukerji and Krishnarao interpret high correlation between higher technical education and GNP per capita such that economic development is made dependent on the flow of technical manpower.¹⁶ But one

13. Mary Jean Bowman and Arnold Anderson, "The Role of Education in Development", *Development of the Emerging Countries*, The Brookings Institution, pp. 153-180

14. Daniel Blot and Michel Debeauvais, "Educational Expenditure in Developing Areas: Some Statistical Aspects", *Financing of Education for Economic Growth*, OECD, pp. 73-83.

15. H. Correa, *Economics of Human Resources*.

16. K. Mukerji and N. Krishnarao "Education and Economic Development in India 1951-61", *Education as Investment*, Baljit Singh (ed.).

can, on the other hand, have an equally plausible interpretation that high income states alone can afford the costs of technical education or simply that income elasticity of demand for higher education is quite high. In fact a less careful use of these correlations can be misleading. Although Harbison and Myers themselves agree at one place: "These quantitative relationships, however, do not establish causal relationships", yet many a time they fall into their self-made trap and most of their recommendations are based on this mistaken causal notion.¹⁷ Policy conclusions based on correlation approach are still less tenable. High correlation taken as indicative of the need of extra effort in the given direction may only "perpetuate or reproduce for future the past miscalculation in terms of imbalances in manpower demand and supply in the case of developing countries."¹⁸

Apart from this basic difficulty there are the usual statistical difficulties of data analysis when it comes (in the case of cross-sectional data) from different countries using different statistical definitions and with different internal monetary units.

One has to be careful in using quantitative measures. The quality of education and the administrative efficiency in spending on education may be no less important than the total educational expenditures. Moreover, in most of the studies only public expenditures on education are taken into account, which in the absence of complete data for private expenditures and other types of educational efforts make them inadequate. In the case of expenditures we cannot also easily ignore the opportunity cost of the educational time of the students.

At least, the rough idea that is available from this approach is only an indicator of the state of educational effort in one or more countries. It is difficult to expect anything approaching the quantitative measure of the contribution of education to economic growth from simple correlation alone.

The Residual Approach

This approach deals with the problem from the side of economic growth. Over a period of time, economic growth is measured

17. See *Journal of Political Economy*, Vol. 73 (1966) No. 3, pp. 315-17 wherein M. J. Bowman reviews Harbison and Myers book cited above.

18. H. N. Pandit, "Economic Approaches to Investment Decision-making in Education," *Indian Educational Review*, January 1970, pp. 41-42.

by increases in the output of a country. But output is a function of certain inputs. If we had a comprehensive full list of all the factors or inputs that explain growth and we could identify and measure them, then there would not be any residual. If it were not possible, we can identify as much of the measurable growth as possible with as much of measurable inputs as possible and then attribute the unexplained part of growth to the residual factor(s). It is generally believed that education is the most important residual factor and what is not explained by other inputs can be attributed to education, at least a substantial portion of it in any case.

In actual practice various techniques have been used to calculate the residual and various interpretations have been given of this residual. Solow used the production function technique. He assumed a linear and homogenous production function. His other and more important assumption was that technical change is neutral in the sense that it does not of its own change the rate of substitution between capital and labour. His study related to American non-farm private economy from 1900 to 1949 and his finding was that "technical progress" explained nearly 87 per cent of the increase in output per labour unit.¹⁹ B. F. Masell working on similar lines found out the residual at 90 per cent of the increase in output per labour unit for 1915-55.²⁰ This residual has then been interpreted as growth due to education, improved knowledge and techniques, and so on. Odd Aukrust employed a slightly different variant of this technique in the case of Norway (1900-55) and found out that 1 per cent increase in human factor raised output by 1.8 per cent while 1 per cent increase each in capital and labour force increased output by only 0.2 per cent and 0.7 per cent respectively. His assumption was that input of the factor "organisation" (which he later termed as human factor) increased at a constant rate during the whole period of investigation. He also assumed that the relation between output and input of capital, labour and organisation can be represented by a Cobb-Douglas function.²¹

19. Robert M. Solow, "Technical Change and Aggregate Production Function", *Review of Economics and Statistics*, August 1957, pp. 312-20.

20. B.F. Masell, "Capital Formation and Technological Change in United States Manufacturing", *Review of Economics and Statistics*, May 1960, pp. 182-188.

21. Odd Aukrust, "Investment and Economic Growth", *Productivity Measurement Review*, No. 16, February 1959, pp. 35-50.

Another technique used is that of index numbers. Input series for labour and capital are calculated separately for each of the two. These input series (taking constant prices) are combined into overall arithmetic index of inputs using share of input factors in the base year as weight. The rate of increase of this series when subtracted from the rate of increase of total output gives the contribution of the residual factor, or whatever you may call it. Thus known data includes shares of capital and labour in national income and the national income itself. In symbols we can write it as

$$R = Y_1 - \left[\frac{Y_0 S_{k0} K_1}{K_0} + \frac{Y_0 S_{n0} N_1}{N_0} \right]$$

where R is the residual factor and

Y = national income

K = capital

N = labourforce

S_k = share of capital in Y

S_n = share of labour in Y

and 0, 1 refer to the periods.²²

J.W. Kenderick applied this index number technique to 1889-1957 data of the United States economy and calculated that the combined input index increased by 1.9 per cent per annum while the output index rose by 3.5 per cent per annum, so that the contribution of "residual" to the increase of what Kenderick calls "the total factor productivity" increase was 1.6 per cent. And this comes to nearly 46 per cent of the total increase in output.²³

Edward F. Denison used the simpler and direct technique but he tried to differentiate the effect of different components of the residual factor. He estimated the direct contribution of education, economies of scale, land, labour (adjusted for quality change) and capital to the overall growth rate of the United States economy for the period 1909-1929 and 1929-57. By subtracting the contribution of these factors from the total growth, he interpreted

22. A.M. Nalla Gounden, *Education and Economic Development*, Appendix 1 (unpublished Ph.D. Thesis presented to Kurukshetra University, Kurukshetra)

23. J.W. Kenderick, *Productivity Trends in the United States*, p. 79.

the 'residual', as 'advance of knowledge'. The 'residual' in Denison's study is small obviously because many of his direct factors were a part of the residual as calculated by other authors. In estimating the direct contribution of education through improvement in the quality of labour force, he uses what comes very close to the rate of return approach. He assumes 60 per cent of the income differentials in the labour force as arising due to differentials in education and also assumes income as reflecting the productivities.²⁴

Denison also tried to apply this technique to the data of nine Western countries. The "residual" or the contribution of "advance in knowledge" to the growth rate of GDP between 1950 and 1962 varied from 10 per cent in the case of Germany to 32 per cent in the case of U.K. In the case of United States it was 23 per cent.²⁵

Actually the "advance in knowledge" and the "contribution of education to growth" should be combined to make comparisons with the results of the previous authors. This we can call as the contribution of 'human factor'. Thus interpreted the contribution of human factor to the growth rate of United States would be 43 per cent for the period 1929-37 and 38 per cent for the period 1950-62. The range for Western countries would be 12 per cent in the case of Germany and 44 per cent in the case of U.K.

Dr. Mushkin has suggested that the residual approach has to be ruled out as it is only a statement of the problem.²⁶ The point is pertinent because the actual growth of output is not entirely accounted for by the known calculable inputs : we are left with a residual, and then it is assumed that the major part of this residual is due to education. This is neither logical nor very satisfactory. Clearly, the residual is a general mix which might mean anything or everything, health, education, quality of the product, etc. Moses Abramovitz has rightly called it as "measure of ignorance". It does not give us any signal for increasing or decreasing spending on anything that constitutes the residual. It is only a postulate that the residual is the human factor.

24. Edward F. Denison "Measuring the Contribution of Education (and the Residual) to Economic Growth", *The Residual Factor and Economic Growth*, *op. cit.*, p. 16.

25. Edward F. Denison and J.P. Poullier, *Why Growth Rates Differ*.

26. See *Economic Aspects of Higher Education*, Seymour E. Harris, p. 56.

The use of aggregate production function in this analysis is also questionable. The aggregate production function does not explain but only assumes a relationship between land, labour, capital and output. And as Gunnar Myrdal points out, it is based on two fallacies, namely, 'illegitimate isolation' and 'misplaced aggregation'.²⁷

The residual approach leans heavily on the quantitative changes in inputs, ignoring altogether the qualitative change in inputs, mostly capital. A major part of the residual can then be attributed to the new investment itself. J. Sandee differs with Denison on this point. Sandee considers the technological progress to be 'embodied' in new plant and equipment while Denison considers it to be 'disembodied'.²⁸

Domar makes the same point in his comment on Solow. Capital in Solow's terminology and context is simply "wooden ploughs piled up on the top of existing wooden ploughs."²⁹ In the residual approach the secular improvements in the nature of capital are thrown over into the general residual.

The point is simple that quantitative increases in capital or labour inputs alone do not explain economic development. John Vaizey is of the opinion that there are four elements of economic growth :

- (a) technological change,
- (b) physical capital accumulation,
- (c) labour skills, and
- (d) the general educational level of society.

Growth is a function of all these four variables and although they can be substituted for each other to a certain degree, yet they are essentially interrelated and growth depends on all of them.³⁰

The residual approach, through quantitative calculations, only implies that instead of physical capital we should look for some

27. Gunnar Myrdal, *Asian Drama*, Appendix 3, Section 7.

28. J. Sandee, 'Comments on Mr. Edward F. Denison's Paper', *The Residual Factor and Economic Growth*, *op. cit.*, p. 74.

29. E. Domar, "On The Measurement of Technological Change", *Economic Journal*, December 1961, p. 712.

30 John Vaizey, "Towards a New Political Economy ?"—*The Residual Factor and Economic Growth*, *op. cit.*, p. 202.

other factors of economic growth. The point has been made often by educationists, sociologists and economic historians.

The forecasting-manpower-needs Approach

This approach does not try to calculate or establish a relation between education and economic growth. It rather starts from the belief that growth requires education and then tries to match the target growth or the probable growth with the required amount of education. Thus, strictly speaking, it is not the method of assessing the relation of education and development unless one listed all the manpower-requirement-forecasts and then compared them with actual happenings and drew conclusions on that basis. No attempt has yet been made in that direction.

But this approach, whatever its analytical significance, is becoming popular mainly because most of the countries at one time or another have faced imbalances in the educational system and educational imbalances in the economic system, e.g., too many admission seekers and too few seats in schools and colleges, scarcity of trained qualified teachers and also at times excess capacity in certain courses and institutions, unemployment of a large body of educated persons at the same time as shortages of skills in others. This approach has two main variants, (a) the social demand approach and (b) the manpower approach.

The social demand approach treats education as basically a service good and tries to estimate future demand for education. This is used as a means towards having a balanced educational system. Demand for education is the sum total of individual demands for education. The simplest method is to take the current enrollments as percentages of relevant age-groups of the estimated population (age-group wise) for a certain future date and thus estimate future enrollment-demands. But the participation ratios or the enrollment ratios themselves change (regardless of official intervention) and we must have an estimated future participation ratio along with such ratios for some intervening years, as the demand for higher education would depend on participation ratios in the primary and secondary education for previous years.

Estimating future participation ratios is not easy. These ratios depend on a number of assumptions and projections regarding the trends in the educational and economic systems; e.g., changes in the intensity of demand for education; the cost of

education and income and its distribution for the target as well as the intervening years; prospects of aid and availability of funds for education; and the need of the economy for manpower, etc.

The government can influence the demand for education directly through legislation for compulsory education and indirectly through financial aid and publicity campaigns. In the former case the social demand would then depend entirely on demographic factors. The UNESCO regional conferences in 1960's fixed educational targets for Asia, Africa and Latin America on the basis of social demand approach.

The forecasting of demand in the usual market sense is a technique for planning education but has little to do with the impact of education on the growth of the economy.

The manpower approach goes the other way about. It predicts the future state of economy on the basis of current trends and policies and then tries to estimate the educational requirements if the current plans and future targets are to be achieved. Education here is clearly a derived demand, a human resource requirement for economic growth. For a certain growth rate, a certain growth of the educational system is necessary. Educational targets then form one of the operative parts of the general economic plan.

This approach also has two variants : (a) direct surveys and (b) manpower planning models. The direct surveys approach, instead of estimating education being sought by the people, bases itself on the calculations made by the employers of educated persons. The employers, public and private, can be asked to give information on the present level of employment as well as of educational qualifications of the employees and indicate their future requirements basing themselves on the targeted rates of growth in different sectors of the economy.

This approach is simple but difficult to implement. A comprehensive survey for the nation would be a very costly affair. As employers have only a short term horizon and do not always have well-thought-out perspective plans, such a survey cannot be relied up for long term planning of education which by its nature has a long gestation period. But the trickiest question is, what about the new firms ? The present establishments have very little to do with them.

The manpower planning models start from the assumption of a well-defined relationship among such variables as growth, employment and education. The economy is divided into different employment sectors and the employment in each sector is divided into specific educational categories. In a simplified model, it is assumed that the relationship between manpower stocks and growth in output is fixed.

Parnes's model follows this approach. After dividing the economy into different sectors like agriculture, transport and manufactures, Parnes takes the average labour-productivity data and by applying these figures to targeted income in each sector he estimates the employment figures for each sector. These employment figures are transformed into occupational and then to educational categories. Thus the number of workers with i th level of education, j th occupation, employed in s th sector is given by

$$W_{ejs} = GNP_s \times \frac{L_s}{GNP_s} \times \frac{L_j}{L_s} \times \frac{L_o}{L_j}$$

where L stands for labour force and subscripts as indicated above.

This is the expansion side of educational structure to which are added the replacement figures after considering deaths, retirement and migration independently.³¹ Beckerman's model also closely follows the Parnes model.³² The main difficulty in this approach lies in the transformation of occupational categories into educational categories. Some occupations do not easily lend to educational classifications, for example salesmen and self-employed shopkeepers. Moreover, as economic growth proceeds there is a general "debasement" of educational qualifications. For example, a few years ago the minimum qualification for most office jobs in India was matriculation. This is being gradually replaced by a university degree. This may not always be due to the fact of less or lopsided economic growth. It can be a condition of growth itself.³³ The current distribution of educated

31. H. Parnes, *Forecasting Educational Needs for Social and Economic Development*, Ch IV.

32. W. Beckerman, *Planning Education for Economic and Social Development*, Ch. X and XI.

33. See *Some Aspects of Economic Development*, W. Arthur Lewis, pp. 19-33.

persons over different occupations does not form a reliable basis, for, this may have been static and be unsuitable for the growing occupational structure of the economy. The occupational structure obtaining in developed countries cannot be a good guide, for conditions in developed countries are not the same as those in the underdeveloped countries, the sharpest difference being in the size of labour force available.

The other main difficulty lies in the estimation of future changes in labour productivity. It has been conclusively shown that the factor-productivity changes over time and such changes are irregular and uncertain, making correct estimation very difficult.

The manpower approach, like other quantitative approaches is deficient in taking account of qualitative changes in education. A mere matching of demand and supply of numbers may neither balance the economy nor satisfy its growth demands unless it is the right kind of education. An extended comment on this is offered when we make a general review of alternative approaches to education for development.

Among the manpower planning models, the Tinbergen-Correa-Bos model is the best known model. The first version of this model was published in *Kyklos* (1962) under the names of Professor J. Tinbergen and Professor H. Correa.³⁴ Later on, a revised version was presented to the Study Group in the Economics of Education of OECD (May 1963) and was published under the names of Professor Tinbergen and Professor Bos.³⁵

The basic model distinguished two levels of educational activity, secondary and tertiary. Primary education is assumed to present no difficulty in the expansion of the other two levels. The model assumed a proportional growth in national income and secondary educated manpower. Those who have already passed the highest grade were assumed to be employed in the production of national income and as teachers in secondary and tertiary levels of education. A series of linear difference equations is constructed to relate the stock of manpower with a certain level

34. H. Correa and Jan Tinbergen, "Quantitative Adaptation of Education to Accelerated Growth", *Kyklos*, Vol. XV, No. 4.

35. Jan Tinbergen and H. C. Bos, "A Planning Model for the Educational Requirements of Economic Development", *The Residual Factor and Economic Growth*, *op. cit.*, p. 147.

of education and the number of students in each level to the aggregate volume of production. The *Kyklos* model used 6 basic relations :

$$(1) \quad N^2_t = v^2 V_t$$

$$(2) \quad N^2_t = (1 - \lambda^2) N^2_{t-1} + m^2_t$$

$$(3) \quad m^2_t = n^2_{t-1} - n^2_t$$

$$(4) \quad m^3_t = n^3_{t-1}$$

$$(5) \quad N^3_t = (1 - \lambda^3) N^3_{t-1} + m^3_t$$

$$(6) \quad N^3_t = v^3 V_t + \pi^2 n^2_t + \pi^3 n^3_t$$

where V = total volume of production (income)

N^2 = labour force with secondary level of education

N^3 = labour force with tertiary level of education

m^2 = those who entered N^2 within previous 6 years

m^3 = those who entered N^3 within previous 6 years

(6 years was supposed to be the training period for secondary and tertiary level of education)

n^2 = number of students in secondary level of education

n^3 = number of students in tertiary level of education

v^2 and v^3 were technical coefficients and π^2 and π^3 were student-teacher ratios at secondary and tertiary levels of education, respectively. Equations (1) and (6) are related to volume of production directly.

Equations (2) and (5) give labour force consisting of those already in it one time-unit earlier and those who joined it during the previous six years assuming that a proportion λ^2 and λ^3 of those already in labour force dropped out owing to death or retirement.

Equations (3) and (4) give number of new comers to labour force with secondary and tertiary levels of education respectively.

Thus it is a balanced input-output growth model with six structural relations. In this general model translation of occupational categories into educational categories is not required. The number of required persons with a certain level of education is related to the stock of persons having completed the level of education and the number of current students in each level is

further related to the volume of production through differential equations.

But there are serious flaws in this type of model building as well.

The most important criticism made against such models is their assumption of unit elasticity of demand for the secondary and tertiary levels of education. It means that the labour force with secondary and tertiary levels of education shall have to increase at the rate at which national income increases. This rules out any substitution between the two levels or any improvement in their productivity or quality. It is analagous to Domar's remark about capital cited above, viz : "wooden ploughs piled up on the top of existing wooden ploughs". Here we have men added to a whole line of men with little improvement in quality overtime. It simply is not plausible.

It is also assumed that this proportional increase of educated labour force for proportional increase in income is valid for all countries. Thomas Balogh has taken serious exception to this rule which implies that the historical factors, cultural factors and particular socio-political structure of the economy are not enough important.³⁶

The manpower approach moreover tries to fill the vacant places in order to match demand and supply. Do we benefit to any extent by this exercise and what are the costs involved in this process ? Such vital questions are simply bypassed.

Historically too, manpower-forecasts have often turned out to be wrong because so many unaccounted factors influence the actual events. Yet the manpower approach as a planning technique for education is very popular because it gives readily usable policy guidelines of whatever worth they might be.

The Rate of Return Approach

The starting point in this approach is to treat education-service as a capital good on the basis that anything that yields a stream of income over time is capital. Income is the product of capital and it can be expressed as the rate of interest or return on its capital. This generalised concept of capital was explicitly

36. Thomas Balogh, "Comments on the Paper by Messrs Tinbergen and Bos", *The Residual Factor and Economic Growth*, op. cit., pp. 180-187.

stated by Irving Fisher and was carried forward by Knight in his work on the theory of capital.³⁷ Tracing the idea of 'man as capital' one can go back as far as 1691 when Petty tried to lay bare the effect of migration and war in the case of England and Angel estimated the money value of man.³⁸ Professor T. W. Schultz of Chicago in his Presidential Address to the Annual Meeting of the American Economic Association in December, 1960, made it the central concept of economics of education. The rate of return approach is now often referred to as the Schultz Approach. For measuring the contribution of education to economic growth, the rate of return to education is related to the growth of educational capital over time.

The rate of return on education is calculated by expressing lifetime earnings differentials between people of higher and lower levels of education as an annual percentage yield on the costs of acquiring the additional education.

The growth of educational capital is the difference between the stock of educational capital over time. The stock of educational capital is measured by adding up the cost of completing various courses/levels of education multiplied by the number of workers for each category of the course/level of education. The starting point here is the cost of completing a course or simply the unit cost of education.

The rate of return is generally calculated from two different points of view. The private rate of return includes only private costs incurred on education. Free services provided by the state are excluded. Earnings used are exclusive of income tax. The social rate of return on education comprises earnings inclusive of income tax and the costs of education are the total resource costs to the economy.

For calculating the rate of return on education, apart from cost data we need data on age-earning pattern by each level of education. Life cycle costs and income streams are calculated for each level of education. The internal rate of return is that rate of discount which equates the present value of the cost-stream

37. Harry G. Johnson, "Comments on Mr. John Vaizey's Paper", *The Residual Factor and Economic Growth*, *op. cit.*, p. 221.

38. B. F. Kiker, "The Historical Roots of the Concept of Human Capital", *Journal of Political Economy*, October 1966, pp. 481-99.

with the present value of the additional income attributed to that incremental education. Of course, both the direct and indirect components of costs and benefits are priced in money terms. That means only those costs or benefits shall be included which are quantifiable in terms of money or at least some monetary value can be imputed to them.

If we take the normal working life of a person at 6-60 years of age then the present value of total additional costs C during the given period of time for obtaining a given amount of additional education would be

$$C = \sum_{t=6}^{60} \frac{C_t}{(1+r)^{t-6}} *$$

and the present value of additional earnings due to additional education would be

$$E = \sum_{t=6}^{60} \frac{E_t}{(1+r)^{t-6}} *$$

where r is our discount rate,

C_t is additional cost of education at time period t and

E_t stands for additional earnings attributable to additional education at time period t .

For calculating the rate of return on education we have to find that rate of discount which equates E and C or makes $E - C = 0$. The rate of return is the value of r in the equation

$$\sum_{t=6}^{60} \frac{E_t - C_t}{(1+r)^{t-6}} = 0 *$$

The rate of return approach gives us a statistical measure of the benefits that flow from education and, for that reason, is also termed as cost-benefit analysis of education.

This approach has been used extensively in U.S.A., Europe and many other countries to analyse education in terms of costs and earnings. Since Schultz's pioneering work many refinements have been introduced in the technique and attempts have been made to eliminate the effect of variables other than education through the use of regression analysis. Hansen in 1963, Becker

*M. Blaug, PRG Layard and M. Woodhall, *The Causes of Graduate Unemployment in India*, p. 212. Also see H. N. Pandit, *op. cit.*

in 1964, Jorgenson in 1967 and Rogers in 1969 have used this technique to calculate the rate of return on education in the United States.³⁹ Almost all of them have found that the rate of return on education is quite competitive with that on physical capital. Besides education, Rogers used four other variables to explain life-time earnings : background, geographic factor, ability and motivation. His findings reveal that all levels of education except the postgraduate level have internal rates of return which are fully competitive with those achieved on physical capital. When 50 per cent costs of higher education are subsidised, the postgraduate degree also becomes competitive.

In the case of India Harberger basing his study of education and earnings on *A Socio-Economic Survey of Hyderabad* conducted by the Indian Institute of Economics (1957) concluded that the rates of return were in the range 10-12 per cent for secondary education and 16-17 per cent for higher education. His calculation of the rate of return on physical capital based on the relevant data of 1001 companies of the large industrial sector yielded him the figure of 17.2—26.1 per cent. Thus investment in machines was found more profitable than investment in men.⁴⁰

V. N. Kothari computed social and monetary return for different levels of education on the basis of survey data for the city of Bombay and explained that the heavy rush for admissions to engineering courses was due to a significantly high rate of return (25 per cent) on that education.⁴¹ Miss Hussain estimated average private rate of return for matriculates at 48 per cent, for graduates at 12 per cent, for postgraduates at 10 per cent and for professional graduates at 9 per cent.⁴² These

39. W.L. Hansen, "Total and Private Rates of Return to Investment in Schooling", *Journal of Political Economy*, April 1963.

Gary S. Becker, *Human Capital*, Part Two, Ch IV.

D.W. Jorgenson and Z. Griliches. "The Explanation of Productivity Change", *Review of Economic Studies*, Vol. XXXIV, 1967 p. 34.

D.C. Rogers, "Private Rate of Return to Education in the United States", *Yale Economic Essays*, Spring 1969.

40. A.C. Harberger, "Investment in Men versus Investment in Machines : the Case of India", *Education and Economic Development*, Anderson and Bowman (eds.)

41. V.N. Kothari, "Returns to Education in India," *Education as Investment*, *op. cit.*

42. I.Z. Hussain, "Return to Education in India : An estimate," *Education as Investment*, *op. cit.*

estimates signify the fact that costs of education in India are appreciably higher and are responsible for comparatively low rates of return on education.

Two recent attempts to calculate the rate of return on Indian education are noteworthy. Nalla Gounden has calculated both social and private average and marginal rates of return on investment in education for the year 1960-61. Social and private rates of return fall as we move up the educational ladder. Social marginal rates of return to education for Indian urban males range from 7 per cent to 17 per cent. The lowest rate of 7 per cent pertains to the marginal rate of return of the bachelor degree over matriculation and the highest rate of return is accounted for by primary education over simple literacy.⁴³ The other study is that by Blaug, Layard and Woodhall. They have calculated both crude and adjusted social and private rates of return on educational investment in urban India in 1960-61 on alternate assumptions. The crude social rate of return ranged from 12.7 per cent to 20.2 per cent; the former pertained to the first degree education over matriculation and the latter pertained to primary education over illiteracy. Similarly the adjusted social rate of return on education showed a rate of 13.7 per cent for primary education over illiteracy and a rate of 7.4 per cent for first degree education over matriculation. The crude rates do not take into account the allowances for the wastage in education, unemployment after education, ability and family background factors and the effects of secular growth in income. The adjusted rates do take into account all these factors. The conclusions of Blaug and his associates are that private rates exceed social rates and are the major factor in explaining the graduate unemployment in India in terms of demand for and supply of educational services.⁴⁴

The rate of return approach is the most popular and the most criticised approach. The major point of criticism against this approach is its assumption that the existing income differentials reflect the differentials in productivities and that these differentials are due to differentials in educational attainments. Various other factors that are believed to determine the differentials in incomes

43. A.M. Nalla Gounden, *op. cit.*

44. M. Blaug *et al.*, *op. cit.*, Ch. IX and X.

are: custom and tradition; arbitrary decisions of a few employers followed by others; relative strength of trade unions; consideration of fairness on the part of employers; native ability and intelligence; achievement and drive; social class and ethnic origin; education and status of parents; on-the-job training; in the case of many traditional societies, caste, community and the area to which an employee belongs; monopolistic elements in the industry; parental wealth and income; access to educational opportunity; and motivation in education.

One can easily see that this listing is not exclusive and there are many other factors which possibly influence the levels of earnings and productivity besides education. John Vaizey warns that "it is dreadfully easy to involve oneself in a chicken-and-egg controversy: 'which came first, the income or the education?' especially in old and class-ridden societies." And he concludes: "It follows, then, that all the statistics may go to show is that incomes are unequal, and that education is unequally distributed; there may be no necessary causal relationship between education and income."⁴⁵

On the other hand, Blaug, Layard and Woodhall dismiss the factors excluded from consideration as causing the least amount of headache. In their view the real difficulty is practical and not conceptual. The problem is manageable in theory. All that we are required to have is a controlled sub-sample which isolates the effects of education.⁴⁶ Stephen Merrett recognises the difficulty as 'econometric' and rules out the use of bivariate distribution. If multiple correlation is used then it would be too difficult to disentangle the independent effects of various variables in the multivariate distribution. There might not be a systematic bias but the size of the standard error increases significantly.⁴⁷

Although one may agree that the problem is just practical yet experience shows that it is not manageable. The sensitivity of the result very much depends on the proportion of the income-differentials one assigns to education. As all factors that influence earnings cannot be quantified either, the decision is quite arbitrary.

45. John Vaizey. *The Economics of Education*, p. 45.

46. M. Blaug *et al.*, *op. cit.*, p. 12.

47. Stephen Merrett, "The Rate of Return to Education: A Critique", *Oxford Economic Papers* (New Series), November 1966.

Various writers have assumed the proportion in the range of 40-75 per cent of observed differentials. Some have, in their fairness, assumed more than one proportion and left the decision of choosing to the users. In view of the fact that the strength and distribution of these factors would vary from time to time and will be different in different places and in different cases, the results are devoid of much operational importance. It is, therefore, not easy to have a true indicator of profitability of investment in education.

There is the related point made by John Vaizey and mentioned earlier, namely, that even if we isolate all other factors, it does not follow that income differentials are due to differences in the levels of education. It is not unreasonable to think that high expenditures on education are induced by high incomes and reflect the fact that the income elasticity of demand for education is high. And once we take income as causing demand for education, that relationship too is not unique; there can be other causal factors—structural, demographic and secular—inducing change in the propensity to consume education as a service. The important part of the demand is the consumption element, i.e., education for its own sake.

Education and income are mutually causative and no scientific basis exists to decide which is the cause and which is the effect. One may of course arrive at a certain figure indicating the percentage return on education by making various tenable and untenable assumptions but its practical value will be certainly limited. If we isolate education from other determinants of income, then so little a part of income is 'explained' by education that its heuristic merit is doubtful. Morgan, David, Cohen and Brazer worked with 14 explanatory variables divided into 84 groups and found that age and education provided only 35 per cent of the variance in income.⁴⁸ John Vaizey remarks, to wit: "Let us take Junior out of school—it's yielding only 8 per cent, and we can get 9 per cent on mending Grandma's broken thigh-bone." And adds: "Do they think this computing is a possible human activity among normal people, let alone a desirable one?"⁴⁹ The conclusion is that it is too difficult to calculate a 'specific' return on a 'specific' investment in man and it would not be meaningful to use such a

48. James Morgan, Martin, David Wilbur Cohen, and Harvey Brazer, *Income and Welfare in the United States*.

49. John Vaizey, "Towards a New Political Economy?"—*The Residual Factor and Economic Growth*, *op. cit.*, p. 201 (footnote).

return for formulation of specific educational policies in exclusion of other considerations. Although Vaizey's warning is a step in the right direction yet his attitude is too nihilistic. In any developing branch of science initial experiments and attempts at quantification may not altogether satisfy the rigour and demands of developed scientific disciplines. Yet it would not be fair to conclude that "economics has little to gain and much to lose by the universal application of capital concept to man", as has been done by some critics of this approach.⁵⁰

Another problem in the rate of return approach relates to intangible benefits that accrue along with the material gains. Some of these external benefits accrue to the individual himself like the opportunity to obtain further education through organised institutions or at home which are available in the form of options to the individual, greater preparedness in facing the changing economic situation and the consumption benefits accruing during the process of education or after. Some benefits also accrue to the government and some to the economy in general.⁵¹ Although some of these benefits can be indirectly measured or some monetary value imputed to them, yet most of them are psychic and elude measurement.⁵² The problem is especially relevant in the case of social benefits or social rate of return. It may be mentioned that all these intangible benefits may not be positive; some of them can be negative too. Moreover these benefits may not be instantly available; a time lag is probable. The rate of return approach takes no account of such benefits. Therefore this approach cannot be regarded as an adequate measure of returns. At best, it indicates only financially measurable returns.

Another important objection to this approach is that it assumes that earning differentials associated with education reflect differences in productivities. This implies that the average wage rate corresponds to the marginal value product of labour. This is so only under pure competition which is rare in the case of labour services. Kaldor is highly critical of this assumption and takes the

50. H. G. Shaffer, "A Critique of the Concept of Human Capital", *Economics of Education*, M. Blaug, (ed.), p. 45f.

51. Ardian Ziderman, "Costs and Benefits of Adult Retraining in the United Kingdom," *Economica* (New Series), November 1969.

52. B. A. Weisbrod, "Education and Investment in Human Capital," *Journal of Political Economy*, October 1962, pp. 106-23.

numerical values assigned to the contribution of education or other such factors of economic growth as "devoid of any scientific foundation"⁵³ On purely theoretical basis, it is not possible to justify this assumption. Blaug, Layard and Woodhall contend that the price system may not be perfectly rational but it certainly reflects scarcity-price relations though with a time-lag. And they take that as a sufficient basis for going into the rate of return calculations.⁵⁴

There are difficulties on the side of costs, too. Ignoring the practical difficulty of collection of data, there is the conceptual problem of inclusion of the opportunity cost of education which indicates alternative earnings of scholars if they had been working instead of learning. The opportunity cost is a sort of 'shadow wage' of the student. There are two arguments against its inclusion. First, the income forgone by the students is conjectural in nature. One could speak of shadow wage of housewives, mothers and such other categories of voluntary work and argue for their inclusion in the national income figures. Vaizey, Balogh and Streeton have expressed themselves strongly against taking account of the opportunity cost. On the other hand, Schultz, Bowman, Becker and Blaug have pointed out its relevance on the ground that what we have to take account of is the "factor costs" of education and not just what is "put in." As Schultz remarks, only by considering the opportunity cost can we really solve many puzzles of economics of education, such as, the early drop out of promising children of poor families and irregular attendance of children belonging to agricultural families, especially in the busy crop seasons. Another indication of its relevance is provided by the schemes of scholarship and assistance in addition to the tuition fee disbursements. These are shadow payments for students' maintenance and are not objected to when included among the costs. In all calculations the opportunity cost will be found to be the major element of total costs. There is an abundant evidence to show that non-attending persons in the study-age do work and earn.⁵⁵ Secondly, the opportunity cost doctrine tacitly assumes

53. N. Kaldor, "Comments on Mr. Ingvar Svennilson's Paper", *The Residual Factor and Economic Growth*, *op. cit.*, p. 131.

54. M. Blaug *et. al.*, *op. cit.*, pp. 15-18.

55. Cf. *The Indian Year Book of Education—Elementary Education*, (1964), p. 198 f.

that the scholars who are studying would have found gainful employment had they not been studying. The opportunity cost is reckoned on the basis of the average wage rate of the concerned age-education group. In the context of widespread unemployment in underdeveloped countries such as India, the assumption of full employment is bloodlessly abstract. It is also arguable that even if the condition of full employment is met, the present students, given the option of working would not be earning the average wage rate of the relevant age-group. Their addition to the number of workers is sure to bring down the entire structure of wage rates in the economy.

Blaug and his associates have tried to overcome the difficulty by multiplying the average earnings of those who are employed by the probability of being employed of those who are studying.⁵⁶ Recently, Clark and Fang in their study of Singapore accounted for the difficulty by extracting from the benefits a part that can be imputed to mortality and the probability of working.⁵⁷ The alternative would be to calculate the average period of unemployment and take it as a negative benefit.

Another point relevant to the use of this approach is that, as it is based on present cross-section statistics, it does not take note of secular changes in the quality and structure of the educational system. The presumption is that life-cycle data would be more appropriate and would give different results, because present data express only the present demand and supply situation. Although Miller has shown that in the case of the United States earning differentials between high school and college graduates have remained fairly constant since 1939,⁵⁸ there is no guarantee that

56. M. Blaug *et al.*, *op. cit.*, pp. 28-31.

57. David H. Clark and Pang Eng Fang, "Return to Schooling and Training in Singapore", *The Malayan Economic Review*, October 1970, pp. 79-103.

$$\text{Probability of workig} = \frac{E}{E+I+U}$$

E=economically active labour force

I =economically inactive labour force

U=number unemployed.

58. H. P. Miller, "Annual and Lifetime Income in Relation to Education, 1939-1959", *American Economic Review*, December 1960.

such would be the case for all countries and for all times. And if the quality of education is improving over time, the expected rate of return based on current data shows a bias towards under-estimation, even when demand and supply move together. It has been pointed out that shifts in earning patterns in three or four decades ahead do not substantially affect the results.⁵⁹ But the secular shifts in demand and supply depend on so many variables that it is difficult to take the present rates as guides for future policies. On the other hand one can say that a good understanding of the present state of affairs is a necessary condition (even if not sufficient) for future policy decisions or even predictions.

A related factor in the operational use of this approach is that with higher or lower returns it indicates only the direction in which to move resources to get the best yield but it does not indicate how far to go in any particular direction.⁶⁰

To conclude, it may be pointed out that no approach for evaluating economic contribution of education is fully satisfactory. All the approaches are based on wide and sometimes far-fetched assumptions. Therefore, extreme caution is necessary in making operational use of any of the approaches. The authors of the various approaches have stated the assumptions and limitations honestly and explicitly and these should be taken note of while evaluating the results based on any one of these approaches.

Economics of education is the newest rage in the science of economics. The stagnation thesis has yielded place to a new wave of optimism based on investment in human capital. "The fundamental problem is no longer considered to be the creation of wealth, but rather the creation of the capacity to create wealth."⁶¹ The capacity to create wealth comes through brain power and the brain power through education and research.

The idea that education helps growth of incomes and raises productivity is not new. Economists and educationists have always been in possession of it. The only difference is that where the older generations took education as akin to capital, it is now identified as a part of capital. The moment we take education as

59. M. Blaug, "The Rate of Return on Investment in Education in Great Britain," *The Manchester School*, Vol. 33, No. 3, 1965.

60. Philips H. Coombs, *What is Educational Planning?* p. 45.

61. H. W. Singer, *International Development*, p. 66.

capital or investment, a host of questions and problems arise : How much does education help growth ? How much of it is needed for a particular stage of development ? What is the right educational-mix for the economy ? How do we evaluate the economic efficiency of the educational system ? All these and many other related questions and their analysis form what is called the Economics of education, historically, the evidence that educational progress is the primary source of economic growth is also not conclusive. Rapid economic growth of Great Britain preceded rapid educational progress in that country by a long distance. It is said that Britain had an average level of education lower than that of some of its European neighbours during the period of its rapid economic growth (1770—1840).⁶² Japan, U.S.A., U.S.S.R. and Denmark seem to have experienced educational and economic progress together and it is not easy to say which is the cause and which is the effect. The type of education imparted, the classes which dominate in receiving education, the stage of development and the other concomitant factors are all important variables in determining the magnitude and direction when we come to think of correlation between education and economic growth. Thus it would not be correct to say that a linear growth in education can directly boost economic development.

What is measured under different approaches is only a part of education. And what is not included is qualitatively different from what is included. Thus the quantitative approach is not only inadequate but can be misleading if too much is read into its results. As a matter of fact it is difficult to comprehend the significance of the various types of education. Speaking of higher education in India, K. N. Raj has the following comments to make :

Clearly what is above all wrong with higher education in India now is that a very large segment of it has ceased to be higher education in any meaningful sense of the term.⁶³

In the same vein Arthur Lewis observes :

The basic reason why poor countries remain poor is unquestionably because they lack knowledge . . . Yet

62. Cf. A.H. Halsey, Jean Floud and C. Arnold Anderson, *Education, Economy and Society*, p. 40 f.

63. K. N. Raj, *Crisis of Higher Education in India* (mimeographed).

it does not follow that the most important use for capital is to invest it in building schools. Education and schools are not the same thing. What goes on inside the school is not always education, and the result may well be to reduce productive capacity rather than to increase it.⁶⁴

What is the right kind of education ? Obviously expansion of religious studies does not have the same meaning as the development of computer training facilities. Judging from the results the Indian system would appear to be carrying a large element of "miseducation" in terms of its development potential. The difficulty of the quantitative approach to education is that it completely ignores the qualitative aspects which go deep into human attitudes which are more important than machines.

Education affects productivity in three ways :

- (a) It adds to the stock of knowledge and spreads it in the economy;
- (b) It maintains skills by passing them on from generation to generation and helps develop new skills; and
- (c) It maintains and carries forward the cultural heritage in the form of people's attitudes to life and work and at the same time rationalises the old attitudes in line with the demands of modern life.

Education can keep the society in its traditional bounds or lift it out into modern age. Often times, social revolution can be seen as the work of a tiny firebrand educated elite, yet a successful revolution often breeds an attitude of 'holding to the line' and does not foster a system which admits of radical changes. What is important is thus the content of education.

The modern quantitative approach has to go by measurable magnitudes, such as, expenditures on education, enrollment ratios and the stock of schooled and trained labour force. These measures as has already been pointed out, do not indicate the level of education or changes in it, nor do they indicate the exact or total impact of education on a nation's productivity. A particular level of enrollment, a given stock of educated labour force or a certain percentage total expenditure on education may have a different

64. W. A. Lewis, *op. cit.*, p. 19.

impact on productivity in two different situations. The qualitative aspect, which is an excluded category, is strategically the most important variable.

Attention may also be drawn to the fact that, as investment goods, education and capital are not mutually exclusive categories but belong together. A machine without a worker qualified to tend it has no productive use. Similarly a trained and qualified worker without any physical capital to work with cannot engage himself creatively. While the former investment taken independently will be a waste of the economy's scarce resources, the latter investment unaccompanied by the former will be a positive menace. Both the investments are needed together and it stands to reason that the two are undertaken in an harmonious relationship with each other. It should be possible to work out the capital-education ratio relevant to a particular stage of growth on the basis of empirical studies of other economies but like the capital-output ratio it has to be understood as subject to severe limitations some of which have been referred to above.

There is another sense too in which the balancing of education and physical capital is needed. This is the general framework of society which has to ensure that the right type of accompanying policy measures and institutional changes are introduced to enable investment in education and physical capital to fructify. The purist may object that we are prescribing changes which are not within our province. But the real question is, where do we draw the line? If education is capital, why not take attitudes, institutions and policy measures as capital? Do they not add to the income stream of the individual and the society?

It will be iterating the obvious to say that investment in education promotes economic growth. However, it may be clearly stated that this relationship does not admit of meaningful application of cost-benefit analysis which is based on a number of abstract and heroic assumptions. The latter exercise has only a limited meaning which has to be understood in the context of exogenous variables. Perhaps there is a case here for the development and application of a suitable "system approach".

CHAPTER III

PROGRESS OF EDUCATION IN PUNJAB

Punjab in its present shape, came into existence on November 1, 1966 when the old Punjab was reorganised and the present Punjab was carved out of it on the basis of language. It is surrounded by Jammu and Kashmir in the North, Himachal Pradesh in the East, Haryana and Rajasthan in the South and Pakistan in the West. Punjab lies between $29^{\circ} 33'$ and $32^{\circ} 31'$ North latitudes and $73^{\circ} 54'$ and $76^{\circ} 56'$ East longitudes, covering an area of 50,260 square kilometres which is about 1.6 per cent of the total area of the Indian Union. With the population of 1,34,72,972 persons according to 1971 Census (provisional totals) Punjab has 2.463 per cent of the total population of the country. The density of population works out at 268 persons per square kilometre. 33.39 per cent of the population is literate, the literacy rate for males being 40.06 per cent and that for females being 25.75 per cent. The literacy figures show a marked improvement over the 1961 figures which were 26.74 per cent, 34.70 per cent and 17.41 per cent respectively.

To form an idea of the progress of education in Punjab we have to face the same difficulties as we faced in the case of old Punjab. There is no single acceptable measure of the level of education. Our review of the theoretical discussion has made things more, not less, difficult. The techniques that have been developed are not adequate and are based on too many uncertain assumptions. It is, therefore, possible to form only a general idea of the progress of education in Punjab by using the various indicators and that is what has been attempted in this chapter.

Broadly conceived, education comprises all types of learning whether in the home, in organised institutions or at places of work. As indicated earlier, this study is concerned with education imparted through recognised institutions for which the required data are available to some extent or can be gathered. The organised

educational activity is a complex mixture which includes general education, technical and professional education, and medical education. As our study is based only on secondary data, official data are our main source of analysis. Insofar as the total expenditure on education is concerned, for all practical purposes our study refers to the period 1964-65 to 1966-67. The expenditure data for the later years are still being processed in the statistical branch of the Department of Education at the time of this writing. Educational activity, by its very nature, has a long gestation period and it appears that the statistics of education have also fallen into the same pattern. This undue lag in the collection and processing of data at official level enabled the Department to generate data even for new Punjab for the three-year period immediately preceding the state's reorganisation. Thus, effectively, our study relates to reorganised Punjab for the period 1964-65 to 1966-67 and the last year of reference is the year of reorganisation itself (1966-67).

Educational Administration

The Department of Education in the state is headed by an officer of the educational services designated as the Director of Public Instruction. The directorate has three wings dealing respectively with colleges, schools and general administration. These wings are under the charge of one or two Deputy Directors, who are helped by Assistant Directors. The directorate has 24 branches including the statistical branch. In the field, the administration of schools is divided into two circles, Patiala and Jullundur, each under the charge of a Circle Education Officer who in turn has deputies and establishment officers. The boundaries of the circles coincide with those of the divisions of the state. At the district level, there is a District Education Officer who in turn is assisted by Deputy Education Officers and Block Education Officers. The college administration is in the charge of Principals of colleges who are directly under the control of Director of Public Instruction. Each college is an independent unit. Private colleges, managed by independent managing committees, are also under the direct control of Director of Public Instruction. In addition to the above three wings there is a separate sports wing in the directorate which is headed by Joint Director, Sports. The directorate has specialised units too, namely, the Science unit, the Evaluation Unit, the Vocational and Guidance Bureau, the English Institute and the Audiovisual Education Library.

There are two types of educational institutions in Punjab :
(i) those maintained and administered by the government; and
(ii) those maintained by voluntary organisations but recognised and aided by the government. So far as school level education is concerned, the government schools are controlled by the Department of Education through its field officers. The management of private schools is characterised by dualism; private schools have their own managing committees but their working is supervised by the inspection staff of the Department of Education. The management of the college level education is shared as follows. The government colleges are concurrently under the Department of Education and the university within whose jurisdiction the colleges are located. There are three universities in the state and one in Chandigarh (the seat of Punjab and Haryana governments, which is a Union Territory) to which all the colleges in the state are affiliated. These universities make rules and regulations for affiliation of a college, prescribe courses of study, lay down rules governing admission and conduct intermediate and terminal examinations. So far as private colleges, are concerned, as already stated above, they have in addition a governing body, called the management committee, of their own.

In 1969 there were 7,147 primary schools, 922 middle schools, 1,145 high and higher secondary schools and 92 degree and post-degree colleges. 1969-70 budget shows that out of the total expenditure of Rs. 27.70 crores under the head '28-Education', a sum of Rs. 78.03 lakhs was on account of expenditure on direction and inspection.

There is a separate directorate of technical education. The management of technical education follows the same pattern as of non-technical education. The medical colleges are under the control of Director of Health Services, which has a separate wing to administer the medical colleges. Commissioner of Education has the overall control of general education as also technical education but medical education is under the overall control of Secretary, Medical and Health.

We shall now try to have a general view of the progress of education in Punjab.

Literacy

According to 1971 Census (provisional totals) the population of Punjab increased from 1,11, 35, 069 in 1961 to 1,34,72,972

in 1971 giving the decennial growth rate of 21 per cent. This shows a slight decrease in the decennial growth rate, the decennial growth rate for 1951-61 being 21.56 per cent. The decennial growth rate for the country as a whole increased from 21.64 per cent during 1951-61 to 34.57 per cent during 1961-71. Thus Punjab showed less than the average growth rate for the country as a whole both in 1961 and 1971. A near stable growth rate in the state in the face of rapidly rising population in the country is a remarkable phenomenon. Whether this has anything to do with literacy, it is difficult to say. The success of family planning campaign, which mainly works through the spoken and the printed word, would seem to depend on the proportion of the literate to total population, especially in the upper age brackets.

The progress of literacy in Punjab during the decade 1961-71 is given in the following table :

TABLE 3.1
LITERACY IN PUNJAB

Year	Literate population			Percentage of literates to total population		
	Persons	Males	Females	Persons	Males	Females
1961	29,77,144	20,84,556	8,92,588	26.74	34.70	17.41
1971	44,98,438	28,81,146	16,17,146	33.39	40.06	25.75

Source : 1. Paper 1 of 1971, *Provisional Population Totals* (Punjab)
 2. Paper I of 1971, *Provisional Population Totals* (India)
 3. *Fact Book on Manpower 1969 Part II*, The Planning Department, Government of Punjab.

The overall literacy in Punjab increased from 26.74 per cent in 1961 to 33.39 per cent in 1971. This gives percentage increase in literacy of 24.87. The all-India figures are 24.03 per cent for 1961 and 29.35 per cent for 1971 giving the decennial growth rate of 22.14 per cent. In 1971 Punjab ranked fifth in terms of literacy among the 18 states of India (excluding the Union Territories). In 1961 Punjab's position was seventh. Punjab has

a better showing in the case of female literacy. In 1971, it ranked third among the Indian States, with female literacy standing at 25.75 per cent. Its decennial growth of female literacy of 47.90 per cent was second only to Maharashtra.

Two important factors need be noted however. First, percentage literacy figures are based on total population; actually the age-group 0-4 should be excluded for the calculation of effective rate. Secondly, for the purpose of census, a person is deemed literate if he can both read and write with understanding in any language. This is a very broad concept and cannot show the educational competence of the population. However, in a predominantly agricultural state like Punjab, the literacy rate is important for dissemination of knowledge about new techniques and methods of modern agriculture. Punjab's effort to have increased literacy is not very impressive. During 1961-71 decade the growth of literacy was only 24.87 per cent, giving Punjab fourteenth place in overall ranking of the states (including the Union Territories). Apart from adult education campaigns, the increase in literacy comes through greater proportion of school-going child population being sent to schools. From the economic point of view, its contribution to productivity would be discernible after a time lag. But the increase in literacy through adult education has immediate economic significance. Unfortunately, the available data cannot be split into these categories.

Schooling

Schooling of the child starts from the nursery stage. In urban areas there are quite a number of nurseries and pre-primary schools. No data are available either in respect of their number or in respect of the number of children on their rolls. All of them are unrecognised and unaided. Tuition fees and other charges in these schools are quite high and only well-to-do urban sections of the population utilise their services. In 1970-71 there were four pre-primary schools in the state run by the Government of Punjab. In 1966-67, there were three such schools, two for boys (one each in Bhatinda and Sangrur) and one for girls (in Amritsar). A total of 181 students, 135 boys and 46 girls, were on roll in these schools in the year 1966-67.

The lack of data in respect of pre-primary education is a gap in the available statistics and needs to be filled in at an early date.

Compulsory Primary Education Act was passed in 1960 and it took effect from 1st April, 1961. A programme to cover all the children in the age-group 6-11 was drawn up. The Act had stipulated that all children of the age-group 6-7 were to be brought under compulsory education during 1961-62, those of the age-group 6-8 during 1962-63 and rest like that in a phased manner. The programme was disrupted on account of the reorganisation of the state in 1966.

Primary schooling has been a 5-year course since 1960-61 and all the primary schools in the state have now five classes. The growth in the number of primary schools since 1964-65 can be seen in the following table :

TABLE 3.2
PRIMARY SCHOOLS IN PUNJAB

Year	Number of primary schools
1964-65	6,979
1965-66	6,947
1966-67	7,002
1967-68	6,988
1968-69	7,190
1969-70	7,147
1970-71	7,212

A fall in the number of primary schools in certain years is actually due to upgrading of some primary schools, mostly government schools, to middle schools. In 1965-66 Punjab had one primary school for every 6.9 square kilometres of area. But averages can be deceptive. In the same year there were 355 villages which had no school and were also not served by any school in the neighbourhood. Of these, 329 villages had a population of less than 300 inhabitants. Of the remaining villages in the state, 3,808 were served by schools from the neighbouring villages and 7,784 had schools within their own boundaries.

The number of schools is not a very good indicator of utilisation of educational services. It only indicates the facilities

available in the state. However, enrollment figures can provide some indication of the extent to which the available facilities are utilised. These figures cannot be given schoolwise but are available classwise, as some of the primary classes are attached to middle and high schools also. The enrollment figures in respect of classes I to V are given in the following table :

TABLE 3.3
ENROLLMENT IN AGE-GROUP 6-11 YEARS
(CLASSES I TO V)

(Figures in lakhs)							
Position as on	Estimated population		Enrollment		Percentage of enrollment to population		Total percentage
	Boys	Girls	Boys	Girls	Boys	Girls	
1.11.66	9.44	8.30	7.51	4.87	79.56	58.67	69.84
15.5.67	9.81	8.65	7.96	5.37	81.25	62.08	72.21
15.5.68	10.20	9.02	8.15	5.47	79.90	60.60	70.80
15.5.69	10.60	9.40	8.27	5.55	77.90	59.00	69.00
15.5.70	11.02	9.81	8.54	5.77	77.50	58.80	68.70

The table shows that although the number of students has been increasing in the absolute sense yet as a percentage of the respective age-population there is a clear decline after 1967. Total enrollment increased from 13.33 lakhs in 1967 to 14.31 in 1970, an increase of 0.98 lakhs or 7.2 per cent. This is a very small increase and the proportion 68.70 per cent in 1970 is a poor showing, considering that the law for compulsory education in this age-group was passed a decade earlier. The all-India target of enrollment for the age-group 6-11 for the year 1970-71 was 78 per cent. An evaluation of the working of the Punjab Primary Education Act (1960) made in 1966-67 revealed that the main reasons for the households not sending their children to schools were economic, such as, financial difficulties, requirements of farm and domestic labour, etc.¹

1. Economic and Statistical Organisation, *Report on the Evaluation of the Working of the Punjab Primary Education Act 1960 (Rural areas), 1966-67*, (mimeographed).

While the number of students has not shown satisfactory increase at the primary stage, the number of teachers in the primary schools has grown considerably :

TABLE 3.4
TEACHERS IN THE PRIMARY SCHOOLS

Year	Number of teachers
1964-65	21,481
1965-66	21,757
1966-67	22,723
1967-68	24,079
1968-69	32,600
1969-70	32,299
1970-71	34,262

The above table shows that the numerical strength of teachers in the primary schools grew by 42.1 per cent during the period 1967-68 to 1970-71. This has to be seen against the fact that the enrollment during the period grew only by 7.2 per cent even after adding enrollment in the primary classes attached with the middle and high schools. The number of students per teacher in fact, declined from 42 in 1964-65 to 39 in 1966-67. Presumably, there is excess capacity at the primary stage as far as teachers are concerned. A concerted effort for enlisting more students into the primary education may not add much to the teacher cost.

Middle Education.

Middle education refers to classes VI, VII and VIII. But traditionally middle schools have comprised classes I to VIII. The following table shows the growth of middle schools during the period 1964-65 to 1970-71 :

TABLE 3.5
MIDDLE SCHOOLS IN PUNJAB

Year	Number of middle schools
1964-65	789
1965-66	840
1966-67	866
1967-68	870
1968-69	870
1969-70	922
1970-71	966

The table shows an increase of 22.42 per cent in the number of middle schools from 1964-65 to 1970-71. Middle classes are attached to the high and higher secondary schools also. Therefore, the growth in the number of middle schools is not a good indicator of the progress of middle school education. For that we turn to enrollment figures in the age-group 11-14 which corresponds to classes VI to VIII.

TABLE 3.6
ENROLMENT IN AGE-GROUP 11-14 YEARS
(CLASSES VI TO VIII)

(Figures in lakhs)		
Year	Enrollment	Percentage increase over the previous year
1963-64	2.9	..
1964-65	3.1	6.8
1965-66	3.3	6.4
1966-67	3.6	10.0
1967-68	3.8	5.5
1968-69	4.3	13.1
1969-70	4.4	2.3
1970-71	4.7	6.9

The Government of India target for enrollment in the middle stage by the end of 1969-70 was 34.8 per cent. Punjab had already achieved that target by 1967-68 when enrollment was 35.1 per cent of the respective age-group. In 1966-67 enrollment as a percentage of the age-group 11-14 years stood at 37.8. Thus Punjab has shown a comparatively higher proportion in the middle stage and much lower in the primary stage. That means that a greater proportion of primary-pass students continue higher education in Punjab than in India as a whole.

The growth in the number of teachers in the middle schools is given below :

TABLE 3.7
TEACHERS IN THE MIDDLE SCHOOLS

Year	Number of teachers
1964-65	7,510
1965-66	7,964
1966-67	8,936
1967-68	8,730
1968-69	12,082
1969-70	12,549
1970-71	13,707

The number of teachers increased by 82.5 per cent during 1964-65 to 1970-71. This confirms our conclusion that middle education in Punjab is more popular. To cope with additional demand, new teachers had to be appointed.

High and Higher Secondary Education.

Punjab has both high and higher secondary schools, that is, schools upto tenth and eleventh classes respectively. But the schooling process in almost all such schools begins either from class V or class VI. Thus middle education is also imparted by the high and higher secondary schools. The higher secondary schools seem to be losing ground as is evident from the following table :

TABLE 3.8
HIGH AND HIGHER SECONDARY SCHOOLS IN PUNJAB

Year	Number of higher secondary schools	Number of high schools
1964-65	299	614
1965-66	299	686
1966-67	293	730
1967-68	285	757
1968-69	269	814
1969-70	252	890
1970-71	252	939

The table shows that during the period 1964-65 to 1970-71, the number of high schools increased by 52.5 per cent while the number of higher secondary schools decreased by 15.7 per cent. The obvious implication is that higher secondary schools are being re-converted into high schools which shows unacceptability of a particular pattern of school education in higher stages.

The progress of secondary education can be seen from the enrollment figures for the age-group 14-16 which corresponds to classes IX to XI. The following table gives this information :

TABLE 3.9
ENROLLMENT IN AGE-GROUP 14-16 YEARS
(CLASSES IX TO XI)

Year	Enrollment	(Figures in lakhs)
		Percentage increase over the previous year
1963-64	1.34	..
1964-65	1.43	6.96
1965-66	1.51	5.33
1966-67	1.64	8.73
1967-68	1.66	—
1968-69	1.76	6.02
1969-70	1.85	5.11
1970-71	2.07	11.80

The table shows that the enrollment in classes IX to XI

increased continuously during the period though the rate of increase was not uniform.

General View of the School Education

We have seen that there has been a phenomenal increase in the number of children going to schools, in the number of schools and in the number of teachers. Taking the percentage of the respective age-group population, primary education shows better performance than middle and secondary education. But considering that primary education has been made compulsory, some 30-35 per cent children were still not attending the schools in 1970-71. We have noted earlier that the main reasons for this failure are economic : lack of financial support or parent's need to have children as helping hands in their farms. Both the reasons flow from the same logic. High cost has no absolute level, it is relative to the vision of the concerned parents. This vision is the use of the kids at home or the farm. If we go by the enrollment figures for each district, it is found out that primary schooling is comparatively less popular in the districts of Bhatinda, Ferozepur and Sangrur.² Recent prosperity through farming in these districts has led the people to believe that they can better do without the children going to schools, presumably because education is not worthwhile or it is more worthwhile to let the children stay at the farm. Experience shows that as farming progresses, birth rate falls, making shortage of labour felt all the more. It would then be still more difficult to bring about an effective increase in the percentage of children going to primary schools.

We have also noted that the rate of growth in the number of students going in for middle and high and higher secondary education is comparatively greater than that going in for primary education, which implies that an increasing number of children who are initiated into the schooling process continue their education beyond the primary stage. One reason for this can be that socially education is considered incomplete till a person is a graudate or at least a matriculate. Another explanation can be that once a student joins the educational field, he is somewhat alienated from his village work-life which induces him to continue in the educational line as long as he can. Is it not often heard

2. Government of Punjab, *Fourth Five-Year Plan* (Draft Outline) p 70.

among the village folk that if one has to work at the farm after being educated, what use was it going through the process ?

College Education

A striking feature of growth of college education in the state is the significant role played by private agencies. At present the majority of the colleges are under private management. However, once these colleges are established and recognised by the Government, a substantial part of their recurring expenses is met by aid from the government. In fact the entire liability on account of introduction of the revised grades following the Kothari Commission recommendations is that of the government. It would, therefore, be interesting to see the growth in the number of private and government colleges separately, as given in the following table :

TABLE 3.10
COLLEGES IN PUNJAB
(GENERAL EDUCATION)

Year	Number of colleges					
	Arts and science colleges		Teacher training colleges		Colleges of physical education (Government)	Commerce colleges (Government)
	Govern-ment	Pri-vate	Govern-ment	Pri-vate		
1966-67	17	54	3	13	1	1
1967-68	17	54	3	13	1	1
1968-69	18	65	3	14	1	1
1969-70	20	71	3	14	1	1
1970-71	20	93	3	14	1	1

As can be seen in the table, during the five-year period ending 1970-71 while the government arts and science colleges grew by 17.6 per cent, the private arts and science colleges grew by 72.2 per cent. The same one-to-five ratio is to be observed in the case of teacher training colleges. What is the implication ?

Expansion of higher education being overwhelmingly in the hands of private bodies, there can hardly be a state plan of

education. In fact, the growth of private institutions has been following an irregular path. There is no growth in the first year after reorganisation, 20.3 per cent growth in 1968-69, a reduced rate of growth of 9.2 per cent during 1969-70, followed by another spurt in the rate of growth to the level of 23.6 per cent. The growth of educational facilities is not linked in any rational manner to the manpower requirements of the economy or tailored to the rising demand for education but is based largely on the unco-ordinated plans of private agencies whose motivation is not always educational. It can also be seen that the bulk of the colleges in the state are arts and science colleges, and there has been no addition to the Government Bikram College of Commerce and the State College of Physical Education, both of which have maintained their solo existence. The major contribution of the government to higher education came in 1969 when it established a multi-faculty university (Guru Nanak University) at Amritsar.

The number of students receiving general education in the state at the college level is given in Table 3.11.

The total number of college students increased by 64.9 per cent during 1964-65 to 1968-69. Detailed figures for the later years are not yet available but an idea of the pattern of general education can be had from the available data. Bulk of the education imparted is in the arts faculty. It would be interesting to calculate the ratio of the number of students in arts and science faculties. This information is given in Table 3.12.

It seems that in all classes students prefer arts courses. What is more significant is that this preference becomes stronger as we move from lower to higher courses. Thus at the postgraduate level nearly 90 per cent of the students belong to the arts faculty. This extra-popularity of arts courses could either be due to the greater availability of or the greater demand for these courses. If it is the latter, there could be two reasons for this. One, that although there is a greater potential demand for science education, yet its cost is prohibitive. Secondly, that the demand for science education is weak because the employment prospects of science-graduates are comparatively dim. The latter hypothesis has to be ruled out because judging by the past experience, an unemployed science-graduate stands a better chance of finding employment than an unemployed arts-graduate. The availability factor thus emerges as the more tenable explanation of the two. The competition

TABLE 3.11
NUMBER OF STUDENTS RECEIVING GENERAL EDUCATION
AT THE COLLEGE LEVEL

Class	1964-65	1965-66	1966-67	1967-68	1968-69
Pre-university					
Total					
Arts	10,387	12,246	16,010	19,014	21,500
Science	6,412	7,551	10,585	12,939	15,600
Home Science	3,932	4,672	5,388	6,075	5,900
3 year degree course	43	23	38	—	—
Total					
Arts	23,371	26,782	32,792	43,849	75,000
Science	14,566	17,059	20,980	30,630	45,000
Home Science	8,778	9,687	11,718	13,219	25,000
Postgraduate classes	27	36	94	—	—
Total					
Arts	1,284	1,274	1,481	2,096	3,350
Science	1,224	1,151	1,301	1,855	3,100
	60	123	180	241	250
TOTAL	35,042	40,302	50,283	64,959	90,950

TABLE 3.12
PERCENTAGE OF STUDENTS IN ARTS AND SCIENCE FACULTIES

Classes	1964-65		1965-66		1966-67		1967-68		1968-69	
	Arts	Science	Arts	Science	Arts	Science	Arts	Science	Arts	Science
Pre-university	61.7	38.3	61.7	38.3	66.1	33.9	68.0	32.0	72.5	27.5
3-year degree course	62.3	37.3	63.7	36.3	64.0	36.0	69.8	30.2	60.0	40.0
Postgraduate classes	95.3	4.7	90.3	9.7	87.8	12.2	88.5	11.5	92.5	7.5

for admission to postgraduate [classes is much keener in science courses than in arts courses. How come, that the facilities for postgraduate science education are not expanding fast in response to the rising demand for such education. The explanation is to be sought partly in the high cost of starting postgraduate science courses and partly in the predominance of the private sector in higher education. An arts college is easy to start. All that you need, to begin with, is a building, endowed in many cases by a rich person for local popularity or prestige, and some furniture. As soon as a college is recognised by the government, a substantial part of the current costs is subsidised by the government. Most of the private colleges provide for science as well as arts courses at the undergraduate level. However, if a student knows that at the postgraduate level he can expect to get admission in an arts faculty only, he would prefer to go in for an arts course even if science course were available to him at the undergraduate level.

The ratio of admission seekers to admission capacity at the postgraduate level would have been revealing. But such statistics are not available. *A posteriori* it cannot be said that science is less popular because there are less students in science courses.

The increase in the number of students indicates that most of the students would like to go in for higher education of whatever kind. The following figures show such an increase during the period 1964-65 to 1966-67 :

TABLE 3.13
PERCENTAGE INCREASE IN THE NUMBER OF STUDENTS
(1964-65 to 1966-67)

Classes	Percentage
Pre-university	54.13
3-year degree course	40.31
Postgraduate classes	15.34

The increase is sharper still for the later years, 1967-68 to 1968-69 as indicated by the following table :

TABLE 3.14

PERCENTAGE INCREASE IN THE NUMBER
OF STUDENTS (1967-68 to 1968-69)

Classes	Percentage
Pre-university	34.29
3-Year degree course	128.71
Postgraduate classes	126.19

This reinforces our conclusion regarding school education, too. An increasing proportion of students now go in for higher education and the rate of increase in the number of students in higher classes has been growing faster than that in lower classes. The census data reveal that the rate of growth of population in Punjab has more or less stabilised. However, there has been an acceleration in the number of students going in for higher education in the state.

Professional and Technical Education

This category includes all types of colleges other than those for general education. Table 3.15 gives the number of institutions for 1965-66, 1966-67 and 1967-68. The table yields useful information with regard to professional and technical education imparted at the college level and the use being made of it. The number of institutions managed by the government and the number of private institutions aided and recognised by the government is given separately.

Colleges of education (teacher training colleges) and colleges of commerce were included in our analysis of general education. But since they form a part of professional courses, they have been included here too, for an overall view. Excepting colleges of agriculture and education, the number of colleges of all other types has been static during the period 1965-66 to 1967-68. The situation has not changed much since then. Thus the openings for professional courses have increased but little, while the colleges of general education have multiplied. The structure of education has become highly biased in favour of general education.

TABLE 3.15
COLLEGES IN PUNJAB (PROFESSIONAL AND TECHNICAL EDUCATION)

	Number of colleges					
	1965-66		1966-67		1967-68	
	Total	Govn- ment	Total	Govn- ment	Total	Govn- ment
Medicine	8	5	3	8	5	3
Education	14	3	11	16	3	13
Engineering	3	1	2	3	1	2
Agriculture	3	2	1	3	1	2
Commerce	1	1	.	1	1	.
Physical Education	1	1	.	1	1	.
Oriental Studies	3	2	1	3	2	1
Rural Institute	1	.	1	1	.	1
TOTAL	34	15	19	38	17	21

In the case of professional courses in engineering and medicine, the intake capacity is more important than the number of colleges. This information is provided in the following table :

TABLE 3.16
INTAKE AND OUT-TURN FIGURES FOR ENGINEERING
AND MEDICAL COLLEGES
(GRADUATE AND POSTGRADUATE COURSES)

Year	Actual Intake		Out-turn	
	Engineering colleges	Medical colleges	Engineering colleges	*Medical colleges
1963-64	360	466	221	299
1964-65	360	526	246	288
1965-66	420	525	215	306
1966-67	360	547	270	346
1967-68	360	546	360	391
1968-69	360	557	300	446

Source : *Fact Book on Manpower 1969, Part III*, The Planning Department, Government of Punjab.

*Out-turn does not include postgraduate degrees but it includes postgraduate diploma courses.

As is evident from the above table, intake in engineering and medical colleges did not change much during the six-year period ending 1968-69. The figures of out-turn depend on the intake of the preceding years and rate of wastage, if any. The out-turn figures do show expansion, particularly in the case of medical degrees but the number includes medical graduates seeking postgraduate qualifications. In the latter case there is an improvement in the skills but not an increase in the number of doctors. But the out-turn of medical graduates taken separately also shows expansion, though not to the same extent.

The following table gives the out-turn of medical graduates per lakh of population during the period 1965-68 :

TABLE 3.17
OUT-TURN OF MEDICAL GRADUATES

Year	Total	Per lakh of population
1965	256	2.00
1966	277	2.10
1967	312	2.39
1968	386	2.75

Source : *Socio-Economic Review of Punjab 1968-69* Government, of Punjab.

The figures reveal a very favourable picture of expansion of medical education in Punjab and a rising trend in terms of doctors per lakh of population. The following table compares Punjab's position with other states in the country :

TABLE 3.18
MEDICAL EDUCATION IN DIFFERENT STATES (1967)

States	Number of Colleges	Total number of students admitted to M.B.,B.S. courses	Total out-turn of M.B., B.S. doctors	Out-turn per lakh of population
Andhra Pradesh	8	1,190	792	1.94
Assam	3	244	255	1.77
Bihar	4	629	507	0.74
Gujrat	5	655	346	1.40
Haryana	.	.	43	0.46
Jammu & Kashmir	1	170	46	1.18
Kerala	4	525	294	1.48
Madhya Pradesh	6	749	592	1.55
Madras	9	1,050	624	1.66
Maharashtra	11	1,401	989	2.11
Orissa	3	404	308	1.52
Punjab	5	411	312	2.29
Rajasthan	5	696	320	1.31
U.P.	7	802	631	0.74
West Bengal	5	670	436	1.04
Mysore	9	1,399	634	2.31

Source : *Statistical Abstract of Punjab 1970*, p. 374.
Socio-Economic Review of Punjab 1968-69 p. 81

Punjab enjoys second place in terms of out-turn of M.B.,B.S. doctors per lakh of population. Although the number of medical colleges and the number of engineering colleges has remained constant, there has been a comparatively greater expansion of medical graduates.

The followidg table gives data about the annual intake and out-turn in respect of engineering graduates per lakh of population:

TABLE 3.19
INTAKE AND OUT-TURN OF ENGINEERING
GRADUATES

Year	Annual intake per lakh of population	Annual out-turn per lakh of population
1963-64	2.99	1.83
1964-65	3.38	1.98
1965-66	2.81	1.68
1966-67	2.73	2.04
1967-68	2.64	2.64

Source : *Fact Book on Manpower 1969, Part III*, The Planning Department, Government of Punjab.

Although the intake figures reveal a decline in the number of engineers per lakh of population, the out-turn figures reveal increasing trend even in the case of engineering.

The discrepancy in the intake and out-turn figures of medical and engineering graduates can be reconciled by taking cognizance of the long duration of these courses. However, it may be pointed out that the above figures do not reveal the availability of doctors and engineers to Punjab in an exact manner. There is a high degree of geographical mobility of professional personnel in the upper grades in general. Added to this is the proverbial greater mobility of the Punjabis as an ethnic-geographical group. Punjabi doctors and engineers are found widely dispersed not only in the country but also internationally.

A word about the decline in the intake capacity may be added. It is both demand and supply induced. Unemployment of

engineers in recent years reduced the great rush for admissions and fearing the socio-political tensions arising out of unemployment of engineers, the state got the intake capacity reduced. Such a measure of course does not solve the problem of educated unemployment; it only shifts the burden to the side of general education.

The lack of preference for science courses is again explained by the lack of availability of facilities of continuing education in that line in comparison to that in the general education field.

An important category of degree level education remains to be examined and that is agricultural education. Postgraduate studies in agriculture are available only at the Punjab Agricultural University at Ludhiana. The courses that are provided are in different disciplines within the broad category of agricultural sciences including such diverse fields as agronomy, entomology, agricultural economics, statistics and genetics.

The following table gives figures of enrollment in and out-turn of postgraduate classes in agriculture in Punjab during the period 1963-64 to 1967-68 :

TABLE 3.20
POSTGRADUATE CLASSES IN AGRICULTURE

Year	Total enrollment	Total out-turn
1963-64	87	65
1964-65	179	66
1965-66	89	166
1966-67	169	59
1967-68	139	111

The 'Green Revolution' in the state has created demand for experts in all branches of agriculture. These experts have in turn helped carry the process of development further through their researches and extension services. Indeed, the Punjab Agricultural University at Ludhiana has made a notable contribution to the rapid growth of Punjab's agricultural economy. It is not possible to measure this contribution in any quantitative manner.

While the postgraduate and doctoral students contribute largely to research, the graduate students are important from the point of view of extension of knowledge to the farmers. The following table gives enrollment figures in respect of degree classes in agriculture for the period 1963-64 to 1967-68:

TABLE 3.21
ENROLLMENT IN DEGREE CLASSES IN
AGRICULTURAL SCIENCES IN PUNJAB
(ALL CLASSES)

Year	Enrollment (both 4-year course and 5-year course)
1963-64	1,120
1964-65	1,039
1965-66	1096
1966-67	1,188
1967-68	1,116

The out-turn figures are given in the next table. As the 5-year course was started in the College of Agriculture at Ludhiana in 1965-66, the available figures pertain to the 4-year course only.

TABLE 3.22
OUT-TURN OF AGRICULTURAL GRADUATES

Year	Total	Out-turn per lakh of population.
1963-64	172	1.43
1964-65	100	0.81
1965-66	123	0.96
1966-67	250	1.89
1967-68	229	1.68

Source : *Fact Book on Manpower 1969, Part III*. The Planning Department, Government of Punjab.

Professional and Technical Education—School Level

Besides professional and technical education at the college level, there are school level institutes imparting professional and technical education. These institutes award a diploma or a certificate after a given period of coaching or training. It is difficult to draw a line between coaching institutes and training institutes. Both engage in schooling of students or trainees in an organised manner. Generally speaking, the training institutes have a clear objective of imparting education which is 'instrumental' while coaching institutes impart education which has independent value, too. But the fact must be noted that in the case of technical education (engineering, for example) and the training of craftsmen, this distinction has little meaning. It is obvious that students do not go in for engineering studies just for the independent value of it. Moreover, such technical education, even if imparted through coaching institutes affiliated to multi-faculty universities, has to be job-oriented. On the other hand, industrial training institutes, even though kept out of the supervision of universities and boards of school education, do impart knowledge and training in techniques which has some independent value, too. An overall view of the progress of education should include the training institutes as well. From the point of view of administration, however, industrial training centres and industrial training institutes are under the control of Director of Industries. The following is a brief description of the main types of school level institutes imparting professional and technical education :

(i) Institutes which conduct a three-year diploma course in engineering. Some of these institutes are attached to the engineering colleges.

(ii) Junior technical schools which prepare students as technicians. These schools award a certificate after successful completion of a three-year course.

(iii) Industrial training institutes/centres which award the National Trade Certificate under the Craftsman Training Programme instituted by the Government of India during the Second World War and later transferred to the state government in 1956. The industrial training centres are equipped and staffed by the state government but are managed by private bodies under the over-

all supervision of the government. The industrial training institutes are wholly managed by the state government.

(iv) Industrial training centres specially set up for scheduled castes and backward classes. These institutes provide certificate and diploma courses.

(v) Government industrial schools for boys providing diploma or certificate courses. These are meant to provide training for skills in textile technology, knitting technology, leather chemistry, cutting and tailoring, etc.

(vi) Industrial institutes exclusively for girls. These are run both by the government and the private agencies for training in crafts such as needle-work and embroidery, stenography, tailoring and cutting. Some provide even teacher training. A certificate is awarded after successful completion of one-year course.

(vii) Arts and crafts teacher training institutes. These provide a two-year course to prepare teachers in arts and crafts.

Excepting the first two categories, these institutes are under the control of Director of Industries (Industrial Training). The progress of these institutes is given in Table 3.23.

As the table shows, the number of school-level technical institutes remained constant during the period 1967-68 to 1969-70 except for an increase of one in the number of industrial training schools for scheduled castes and backward classes and a decrease of one in the number of junior technical schools. The sanctioned capacity for admissions was reduced in all cases except for arts and crafts teacher training institutes but was increased in the case of industrial schools for girls. The latter do not produce career girls: many of the students are married housewives or unmarried girls who take up industrial courses to add to their efficiency as housewives. The demand for skills in embroidery, needlework, cutting and tailoring is likely to grow until such time as these skills form a part of regular curriculum in the girls schools and all girls go to attend the schools. The other institutes listed in the table are expected to turn out workmen for the industrial economy of the state. The seating capacity for diploma-study in engineering has been reduced by 16.7 per cent, in the case of junior technical schools by 11.8 per cent, in the case of industrial training schools for scheduled castes and backward classes by 15.4 per cent

TABLE 3.23
TECHNICAL AND PROFESSIONAL INSTITUTES
(SCHOOL LEVEL)

Type of institute	1967-68		1968-69		1969-70	
	No.	Seating capacity	No.	Seating capacity	No.	Seating capacity
Polytechnics	8	1,440	8	1,200	8	1,200
Junior technical schools	3	170	3	170	2	150
Industrial training centres/institutes	27	11,260	27	11,256	27	11,256
Industrial training centres (for scheduled castes and backward classes)	2	208	3	176	3	176
Government industrial schools (boys)	7	840	7	810	7	810
Industrial schools for girls (private and government)	53	2,314	57	2,634	53	2,876
Teacher training institutes (arts and crafts)	3	240	3	240	3	240

Source : *Statistical Abstract of Punjab* for 1968, 1969 and 1970.

and in the case of government industrial schools for boys by 3.6 per cent. This all-round decrease has come as a result of lack of demand for these courses. Even with the reduced capacity, the current admissions do not fill up all the places. For example, in the case of Diploma in Engineering the actual intake as a ratio of intake capacity shows a continual decline since 1966-67 as indicated in the table below :

TABLE 3.24
DIPLOMA IN ENGINEERING

Year	Total intake capacity	Actual intake	Actual intake as a percentage of intake capacity
1965-66	1,420	1,381	97.2
1966-67	1,560	1,542	98.8
1967-68	1,560	1,492	95.6
1968-69	1,290	824	63.9
1969-70	1,140	800	70.2

Source : *Socio-Economic Review of Punjab 1968-69.*

Note : As the capacity and intake figures here include the part-time short-duration diploma courses, these do not tally with those in the previous table.

Even after reducing the capacity by 11.6 per cent in 1969-70 the actual intake fell short of the capacity by nearly 30 per cent. And we should note that even when, between 1966-67 and 1969-70, the intake capacity was reduced by nearly 27 per cent the actual intake decreased by 48 per cent and the actual intake as a percentage of the intake capacity fell from 97.2 to 70.2.

The story is the same in the case of craftsmen being produced by the industrial training institutes/centres. The actual intake in these institutes/centres as a percentage of the sanctioned capacity during 1966 to 1969 was as follows :

TABLE 3.25
CRAFTSMEN IN PUNJAB

Year	Intake as a percentage of sanctioned seats [1966 to 1969]
1966	93.1
1967	86.7
1968	65.8
1969	56.5

Source : Based on figures given in *Socio-Economic Review of Punjab 1968-69*.

Thus, it appears that there is a considerable excess capacity in the educational set-up as far as the technical education is concerned. This under-utilisation, which implies waste of resources is being carried by the system in the hope that soon the pace of industrialisation would pick up and there would be an additional demand for technical and industrial skills. But that is a hope for the future. How did this excess capacity come about? Obviously, the expansion of technical education was not tailored to the needs of industrialisation. The government seems to have acted under the impulse that technically qualified personnel would somehow bring about industrialisation. Growth does depend on technically qualified personnel to man the machinery but that alone is not sufficient to generate growth. A proper balancing of education and other factors is necessary. The right factor-mix is not fixed: it varies with time and stage of development. Even with a given factor-endowment, quite a lot depends upon people's attitudes and social institutions which condition utilisation of resources. Again, it is not the structure or numerical expansion of social institutions nor even the linear expansion of the whole system that matters. Attitudes are a part of wider socio-cultural environment which can be changed through education. Thus in the ultimate analysis the content of education is the most important single factor.

Miscellaneous School Education.

Para-medical education is the most important in this category. The number of schools and the number of seats for the various

courses in para-medical education has remained constant for several years now. At present, there are four training schools for nurses, two for lady health visitors, one for sanitary inspectors, two each for compounders, pharmacists and laboratory technicians, four for auxiliary nurse-midwives and two for radiographers in Punjab. The total seating capacity for all these institutions was 1,164 in 1967-68, the out-turn being only 404 in that year. There are four institutions in the state for the deaf and dumb and otherwise physically handicapped persons. This number has remained constant during the past four years.

The general comments on technical and professional education apply to the para-medical education as well. Here too the imbalance in regard to the seating capacity and the utilisation is evident.

CHAPTER IV

EXPENDITURE ON EDUCATION

The expenditure approach to education can be said to be a macro-approach. The entire system of education can be analysed in terms of the level of expenditure on education in different years. The total expenditure can then be disaggregated and the growth in the number of institutions, the students on roll, the intake strength and the number of teachers for each such level can be compared in terms of the amount of money spent on each activity.

Educational expenditures come through two different sources, private and public. Public expenditure figures can be extracted from the budgets relating to the various departments involved in the process of education. Private expenditure figures are not that easily available. Expenditure data of private bodies in the management of private recognised educational institutions are collected by the statistical branch of the Department of Education. These data could be of great use but unfortunately the processing of these data is given a low priority as compared to data relating to the enrollment figures and the number of institutions. At present, expenditure data are available only for the years 1964-65, 1965-66 and 1966-67.

The next important category of expenditure is that of students and/or their guardians. In a completely nationalised or an entirely free system of education, private individual costs of education, or the unit costs of education as they are called, would be zero.† Such a situation does not exist anywhere. At present we do not have reliable data for this category of expenditure. The National Sample Survey schedule for consumption expenditure did include 'education' as one of the items of expenditure but defined it in a way as to include in it expenditure on newspapers and books in general also.

†Some economists would like to include the opportunity cost of time spent in education as part of the private costs of education in such a situation.

TABLE 4.1
PUBLIC EXPENDITURE ON EDUCATION

(Figures in rupees)					
	1966-67	1967-68	1968-69	1969-70	1970-71
	(Accounts)	(Revised estimates)	(Accounts)	(Accounts)	(Revised estimates)
					(Budget estimates)
1. Total general education of which:	20,66,26,910	21,10,94,640	25,25,80,026	27,70,21,840	30,78,20,030
technical education	26,45,202	22,64,250	25,55,374	44,95,831	61,72,520
2. Medical colleges and schools	88,23,234	50,20,420	56,63,028	80,79,600	73,67,120
3. Agricultural education	93,080	83,400	75,249	5,99,687	3,91,490
4. Veterinary education and research	4,70,210	75,380	91,582	82,491	87,740
5. Industrial training	1,02,54,099	89,34,630	91,01,881	1,34,26,219	1,40,76,540
TOTAL	22,62,67,533	22,52,08,430	26,75,11,766	29,92,09,837	32,97,42,920
					35,63,77,910

Moreover, such figures are available only for the year 1964-65 (i.e. 19th round).

Public Expenditure on Education

In most of the literature public expenditure on education is restricted to general education or at the most to general education and technical education, i.e. to expenditure which is disbursed through the Director of Public Instruction and the Director of Technical Education (budget head 28-E). But in our more inclusive concept of education as organised recognised schooling, some expenditure incurred by other departments would also be included. We are, therefore, adding expenditure on medical colleges and schools, agricultural education, veterinary education and industrial training to the expenditure under general and technical education to get at the total expenditure figures. The figures for the various years have been culled from the budgets of Government of Punjab as presented to the legislature and are given in Table 4.1.

The absolute and the percentage increase in public expenditure on education in each year over its previous year can be read from the following table :

TABLE 4.2
INCREASE IN PUBLIC EXPENDITURE ON EDUCATION

	1968-69	1969-70	1970-71	1971-72
Absolute increase over the previous year (rupees)	4,23,03,296	3,16,98,071	3,05,33,083	2,66,34,990
Percentage increase over the previous year	18.8	11.8	10.2	8.2

The above two tables reveal that although total public expenditure on education has been increasing since reorganisation, yet the absolute increase for each successive year has been less than that for the previous year and consequently the percentage increase for the four years (1968-69 to 1971-72) shows a marked decline. In other words, we can say that marginal expenditure

has been declining and total expenditure shows an increase at a declining rate.

This is contrary to the general impression of increasing importance being attached to education in general. In fact if we take the case of general education (including technical education) but excluding medical education, veterinary education and industrial education) the marginal rate of growth in public expenditure for the years 1968-69, 1969-70, 1970-71 and 1971-72 has been 19.6 per cent, 9.7 per cent, 11.1 per cent, and 7.0 per cent respectively. The extraordinary growth in the year 1968-69 is mostly due to the revision of the salary scales of teachers following the government's acceptance of the recommendations of the Kothari Commission. The point is that although education continues to be an important item of government expenditure and it is certainly a growing item, yet over the years the growth rate has been declining. Between 1967-68 and 1971-72 the annual public expenditure increased by 58.2 per cent. As noted earlier, in some fields of higher education, private institutions abound and have grown at quite a rapid pace. Therefore, it follows that total expenditure on education must have risen considerably.

Even in the case of the declining trend in the growth rate of public expenditure on education, the decline is due to the general trend in the revenue budget itself. Total government expenditure on revenue account for the four years ending 1971-72 is indicated in the table below :

TABLE 4.3
PUNJAB GOVERNMENT EXPENDITURE
(REVENUE ACCOUNT)

(Figures in crores of rupees)			
Year	Total expenditure	Increase over previous year	Percentage increase over previous year
1968-69 (Accounts)	111.91
1969-70 (Accounts)	122.50	10.59	9.46
1970-71 (Revised estimates)	135.92	13.42	10.90
1971-72 (Budget estimates)	149.36	13.44	9.89

It can be seen that the marginal rate of growth of the general revenue expenditure sets the pace for the educational expenditure as well. In fact, the educational expenditure as a percentage of the general revenue expenditure shows a fairly constant proportion for these years.

TABLE 4.4
SHARE OF EDUCATION IN THE TOTAL
REVENUE EXPENDITURE

Year	Expenditure on total education as a percentage of total revenue expenditure.
1968-69	23.9
1969-70	24.4
1970-71	24.26
1971-72	23.86

Roughly speaking, allocations for education take up about one-fourth of the general budgetary expenditure.

We can further say that per capita public expenditure on education has been constantly rising. The average rate of growth of population in Punjab, according to provisional totals of 1971 Census, is 2.1 per cent. As can be seen from Table 4.3, expenditure on education is budgeted to rise by 9.9 per cent even in 1971-72. Per capita public expenditure on education can be calculated by considering the size of the population for the relevant years. We take the population for the year 1966-67 as the average of the population for the years 1966 and 1967. Using the compound rate of growth on the basis of the census population for the year 1961 and 1971, the estimated population for different years and per capita public expenditure on education for these years come out as follows :

TABLE 4.5
POPULATION AND PER CAPITA
EDUCATIONAL EXPENDITURE

Year	Estimated population	Per capita public expenditure on education (Rs.)
1966-67	1, 23, 51, 299	18.32
1967-68	1, 25, 85, 974	17.89
1968-69	1, 28, 25, 108	20.86
1969-70	1, 30, 68, 785	22.89
1970-71	1, 33, 17, 092	24.76
1971-72	1, 35, 70, 117	26.26 (budgeted)

Thus since the reorganisation of the state, per capita public expenditure on education has risen by 43.3 per cent or on an average at the rate of 8.7 per cent per annum. This would be a creditable achievement if the expenditure alone were the criterion of achievement. But as concluded earlier, expenditure and efficiency are not always the same thing. It is conceivable that the above figures reveal a success more on the population front than on the educational front.

Public expenditure on education can also be expressed as a relative of state income. The data for state income is available only upto 1968-69. As we are confining ourselves to education since the reorganisation of the state, state income, per capita income and government expenditure on education as a percentage of state income are given only for the three years beginning 1966-67.

TABLE 4.6
STATE INCOME AND GOVERNMENT EXPENDITURE
ON EDUCATION

Year	Net state income (Crores of rupees)	Per capita income (Rupees)	Government expenditure on education as percentage of state income
1966-67	950.86	720	2.38
1967-68	1113.47	818	2.02
1968-69	1236.53	881	2.16

Source : *State Income of Punjab 1960-61 to 1968-69* (Revised Series), Economic and Statistical Organisation, Government of Punjab.

The table shows that although state income increased by Rs. 285.67 crores or by 30 percent during 1966-67 to 1968-69, the percentage government expenditure on education during the period remained almost static at 2 per cent.

The general conclusion that follows from our analysis of public expenditure on education is that although at current prices a lot more is being spent on education today, yet in terms of educational effort, the situation hardly looks different from what it was before. The same proportion of government revenue and the same proportion of state income are being spent today as before. State income, per capita income, total government revenue and total amount of expenditure on education have all risen, yet they have all risen in a line. In the perspective of state economic activity and the government activity, education shows a linear growth in so far as the expenditure dimension is concerned. But a linear growth of the system in terms of expenditure, unaccompanied by any significant qualitative improvements, may not have made the system any more fruitful than it was a few years ago. On the other hand, if imbalances in the system have been allowed to persist, they might have weakened the system and reduced its effectiveness for progress.

TABLE 4.7
DIRECT EXPENDITURE ON HIGHER EDUCATION

(Figures in rupees)

Type of institutes	1964-65		1965-66		1966-67	
	Number of institutes	Expenditure	Number of institutes	Expenditure	Number of institutes	Expenditure
Universities	2	1,36,23,651 (35.4)	2	1,49,72,281 (33.8)	2	2,41,75,075 (40.8)
Colleges of general education (arts and science)	58	1,22,88,273 (31.9)	62	1,42,12,169 (32.2)	65	1,66,13,420 (28.1)
Colleges of professional and other education (except teacher training)	29	1,11,28,302 (28.9)	40	1,33,17,728 (30.1)	—	1,64,10,210 (27.7)
Teacher training institutes (post-graduate and undergraduate)	29	14,22,407 (3.8)	29	17,05,601 (3.9)	29	19,86,666 (3.4)
TOTAL	118	3,84,62,633	133	4,42,07,779	—	5,91,85,371

Note : Figures in the brackets show percentage of the total for the year.

TABLE 4.8

DIRECT EXPENDITURE ON SCHOOL EDUCATION

(Figures in rupees)

Type of schools	1964-65		1965-66		1966-67	
	Number of schools	Expenditure	Number of schools	Expenditure	Number of schools	Expenditure
High and higher secondary schools	914	4,19,10,063	985	4,86,12,501	1,023	5,51,57,421
Middle and senior basic schools	789	1,28,43,312	840	1,41,01,204	866	1,66,50,436
Primary and junior basic schools	6,979	2,98,86,150	6,947	3,35,25,517	7,001	9,02,50,436
Pre-primary and pre-basic schools	4	22,131	4	28,011	3	17,233
Vocational and professional and special schools	288	84,04,433	297	73,49,949	372	63,77,209
TOTAL	8,974	9,30,66,089	9,073	10,36,17,182	9,266	16,84,74,565

Total Expenditure on Education

The data for total expenditure on all types of institutes is available only for the years 1964-65, 1965-66 and 1966-67. Although this data belongs comparatively to an earlier period and ends with the year of reorganisation, yet it would be fruitful to examine it because it is inclusive of all types of expenditure incurred both by private agencies and the government. Even if it does not tell much about the movement of the system as a whole, analysing its various constituent elements would be useful. The data has been collected personally from the statistical branch of the State Department of Education.

Higher Education

Higher education is imparted in the universities; colleges of arts and science; professional colleges in agriculture, commerce and engineering; medical and dental colleges; and ayurvedic colleges. Expenditure itself can be bifurcated into direct expenditure and indirect expenditure. Direct expenditure includes: salaries of teachers, salaries of other staff and recurring expenditure on equipment and other appliances. Indirect expenditure includes: expenditure on direction and inspection, expenditure on buildings and hostels, non-recurring expenditure on equipment and other appliances and stipends, scholarships and other financial concessions.

The actual direct expenditure on higher education during the period 1964-65 to 1966-67 is given in Table 4.7.

Total expenditure on higher education increased by 53.9 per cent during the three years 1964-65 to 1966-67, the increase being greater for 1966-67 over 1965-66 (33.9 per cent) than for 1965-66 over 1964-65 (14.9 per cent).

Among the constituents of higher education, the universities have always got the highest proportion of the total expenditure (33-40 per cent). As both the universities in the state are statutory state-aided bodies, this also means that government spends the most on the universities. We have earlier noted that most of the colleges of general education are privately managed. This group constitutes the next claim on total funds (28-32 per cent). Technical and professional colleges together claim less than 30 per cent of the total funds. The least amount is spent on teacher training institutes (less than 4 per cent). Over the years, the proportion

of total expenditure has increased from 35.4 to 40.8 per cent in the case of universities while it has decreased from 28.9 per cent to 27.7 per cent for colleges of professional and other education. It has remained almost the same in the case of teacher training institutes. But three years is too short a period to determine the general trend. However, our conclusion reached earlier that education in the state is biased in favour of higher education in the general field is confirmed.

School Education

This includes high schools and higher secondary schools in the secondary education; middle and senior basic schools in the middle standard education; and primary, junior basic and pre-primary and pre-basic schools in the lower section. Besides, there are vocational and professional schools as also special schools for the handicapped persons.

Total expenditure on school education along with its distribution over different types of schools is given in Table 4.8.

During 1964-65 to 1966-67 the total direct expenditure on school education increased by 81.0 per cent. This is a significant increase. The major increase is accounted for by the primary schools where direct expenditure increased by nearly 202.0 per cent. Expenditure on high and higher secondary schools and middle schools also increased considerably but expenditure on pre-primary education and professional, technical and special schools shows a decline. Increased expenditure on primary education can be accounted for by the expansion of the existing schools as the number of schools does not show a comparative increase. On the other hand, in the case of professional and special schools, although the number of schools has increased, yet the expenditure has decreased. This can only mean that the facilities initially provided were more than actually required. In fact this conclusion was reached even earlier when we studied the enrollment pattern. Thus although the general education in the state is making headway, technical education is lagging behind even where facilities at the school level exist. This excess capacity in professional and technical education at the undergraduate and the school level is an unfortunate feature of the Punjab's educational system. The distribution of total expenditure over different types of schools during the three-year period under reference has also changed, as

shown in the following table :

TABLE 4.9
DISTRIBUTION OF DIRECT EXPENDITURE ON
SCHOOL EDUCATION

Types of schools	Percentage of total direct expenditure	
	1964-65	1966-67
High and higher secondary schools	45.0	32.7
Middle and senior basic schools	13.8	9.9
Primary and junior basic schools	32.1	53.6
Pre-primary and pre-basic schools	0.02	0.01
Professional and special technical schools	9.0	3.8

The share of primary education in the total school expenditure increased from 32.1 per cent to 53.6 per cent. This extraordinary increase has taken place at the expense of other types of schools, the maximum fall being shown by the expenditure on special and professional schools. The increase in the expenditure on primary education might be less spectacular when we take the overall expenditure on education. But we should note that primary classes are attached to high and higher secondary schools as well as middle schools. The expenditure shown here pertains only to the primary schools and not to the primary education as such.

Indirect Expenditure

The total expenditure on education includes, besides direct expenditure, indirect expenditure. The growth in the indirect expenditure during 1964-65 to 1966-67 for all types of institutes is given in the following table :

TABLE 4.10
INDIRECT EXPENDITURE ON EDUCATION
(Figures in rupees)

Items	1964-65	1965-66	1966-67
Direction and inspection	43,67,065	46,88,305	42,59,475
Buildings	1,69,64,119	1,63,68,638	1,57,86,542
Hostels	30,11,511	19,33,664	13,88,444
Scholarships, stipends and other financial concessions	91,47,633	93,65,376	1,14,71,513
Equipment and other appliances (non-recurring)	51,85,434	38,28,406	64,81,159
Other items	36,58,846	27,52,529	20,14,831
TOTAL	4,23,34,608	3,89,36,918	4,14,01,964

Over the period of three years total indirect expenditure on education has almost stayed constant around Rs. 4 crores. The variation is very small. But a few constituent elements show variation. The expenditure on scholarships and stipends and other financial concessions increased by Rs. 23.24 lakhs or by 25.4 per cent. The miscellaneous expenditure shows a decline. Similarly, expenditure on hostels came down considerably, by 53.9 per cent. The direction and inspection expenditure has not changed much and the same is true of buildings. The net result is that total indirect expenditure has not changed much.

If we look at the distribution of indirect expenditure over various items, it is clear that the major share is taken up by buildings. This includes both the construction of new buildings and the repair and maintenance of the old ones. Expenditure on scholarships and financial concessions constitutes the next big item accounting for 27.7 per cent of the total indirect expenditure in 1966-67. Next in importance is expenditure on non-recurring equipment and appliances and then comes expenditure on direction and inspection. Direction and inspection costs are the

TABLE 4.11
TOTAL EXPENDITURE ON EDUCATION
(Figures in lakhs of rupees)

Items	1964-65	1965-66	1966-67	Percentage increase in 1966-67 over 1964-65
1. Total direct expenditure on higher education of which :				
expenditure on universities	384.63 (22.2)	442.08	591.85 (22.0)	53.9
expenditure on colleges (all types) of which :				
expenditure on professional and other colleges (excluding teacher training)	248.39	292.36	350.10	40.9
	111.28 (6.5)	133.18	164.10 (6.1)	47.2
2. Total direct expenditure on school education of which :				
expenditure on high and higher secondary schools	9,30.66 (53.5)	1,036.17	1,684.75 (62.6)	81.0
expenditure on pre-primary, primary and middle schools	419.10	486.12	551.57	31.6
expenditure on vocational and other schools	427.52 (24.6)	476.56	1,069.41 (39.7)	150.1
	84.04 (4.8)	73.50	63.77 (2.4)	-24.1
3. Total indirect expenditure on all institutes	423.35 (24.3)	389.37	414.02 (15.4)	-2.2
TOTAL	1,738.64	1,867.02	2,690.62	54.7

costs of administering and supervising the educational system and they constituted 10.3 per cent of total indirect costs in 1966-67. As the total of such costs has shown only a small variation, its proportion has remained around 10 per cent.

During the three-year period under study, we observe that direct expenditure on education has increased while indirect expenditure on education has not changed much. Therefore total expenditure on education shows an increase which is less than was depicted through direct expenditure alone. The consolidated picture of total expenditure on education can be seen in Table 4.11.

The total expenditure on education increased by 7.4 per cent in 1965-66 over 1964-65 but it increased by 44.1 per cent in 1966-67 over 1965-66. The overall increase in 1966-67 over 1964-65 comes out at 54.7 per cent. Thus in terms of expenditure on education, the year of reorganisation of Punjab is a significant year.

Over the period of three years the maximum growth has been in the case of expenditure on primary and middle schools. The proportion of total expenditure on this item increased from 24.6 per cent to 39.7 per cent, while the school education as a group increased its share from 53.5 per cent to 62.6 per cent only. This is explained by a fall in the share of vocational and other schools in total education and comparatively little improvement in the share of high and higher secondary schools to total education.

Higher education as a group grew in terms of expenditure by 54 per cent, the major growth being in the expenditure on universities which comes out at 77.4 per cent.

Thus higher education continues to take up more than one-fifth of total expenditure but this includes all types of higher education institutions. The share of professional and other college expenditure in total expenditure has decreased only marginally, though in absolute terms the expenditure has grown by 47 per cent. But even here the growth is much less than the growth in the total expenditure.

We can conclude that primary education is the only item which has increased its share of the total expenditure. Higher education accounting for more than one-fifth of total expenditure has retained its importance. But professional college education has decreased

its share marginally. Professional school education has got its share of the total exactly halved, a significant decrease.

For the year 1966-67 another interesting fact may be noted. In our study of the government expenditure on education we found that the government spent Rs. 2,262.67 lakhs on all types of education. Total expenditure, both government and private comes out at Rs. 2,690.62 lakhs for this year. This means exclusive contribution of the private recognised sector to total expenditure on all types of institutes was Rs. 427.95 lakhs or say 15.9 per cent of the total expenditure on education. This gives us the ratio of government to private expenditure in education as 84 to 16. That is, nearly 19 per cent of the government expenditure was added to by the private sector in the total educational effort during 1966-67. It would be an interesting study to find out how this ratio has behaved subsequently but we do not as yet have data for the later years.

Investment in Education

Investment in education is a broad term. It includes total expenditure on education by the government and the private agencies. But there are other items of expenditure incurred by the students or their guardians which ought to be included in the total expenditure, such as, payment of tuition fees and other dues, cost of books and stationery and extra maintenance expenses in the case of boarders. To this is sometimes added the opportunity cost of the time spent on education. The aggregate of all such costs is the total real cost of education. No direct secondary data is available in this field. But the National Sample Survey data on household and per capita consumption can give some help. For our purpose we take only the year 1964-65, the starting year of our expenditure study. National Sample Survey 19th round refers to the period 1964-65. The data was collected for the old Punjab but the results have been generated for the new Punjab, though they include Chandigarh area. Report on consumption expenditure was obtained through Schedule 16. Data was collected for 16 broad groups of expenditure and one of them was "miscellaneous goods and services". This group included expenditure on education and is a relatively minor group claiming only 7.66 per cent of the total consumer expenditure in rural areas and 15.29 per cent in the urban areas. Within this group, education was the second

sub-total consisting of the following five items:

- i) books and journals,
- ii) newspapers and periodicals,
- iii) stationery articles,
- iv) tuition fees (school and college), and
- v) other educational expenditures.

Newspapers and periodicals, although a part of educational expenses, are not expenses of organised schooling according to the definition of education we have adopted. It may also be pointed out that we are using only the state-sample data. This data is available classwise according to the monthly per capita expenditure classes both rural and urban sectors). However, we have restricted our analysis to all expenditure classes in the combined manner.

The data shows the estimated rural population of 85,27,200 persons and per capita monthly expenditure on education of Rs. 0.22 for these persons, giving us a total of Rs. 18,74,984 as private rural expenditure on education per month or Rs. 2,25,11,808 for the year 1964-65.

The estimated urban population was 26,54,370 persons and the per capita monthly expenditure on education for these persons was Rs. 0.72. The total private urban expenditure on education was thus Rs. 19,11,146.40 per month or Rs. 2,29,33,757 for the year 1964-65.

The total of both urban and rural private expenditure on education comes to Rs. 4,54,45,565 for the year 1964-65. From Table 4.11 we have total institutional expenditure on education (direct and indirect) for the year 1964-65 as Rs. 1,738.64 lakhs. We can now add to it the private expenditure on education and reach the total figure of Rs. 2,193.09 lakhs for 1964-65.

Extra maintenance expenses incurred by the guardians on the pupils who reside in the hostels are clearly an item of expenditure on education. These need to be added to the above total to arrive at the total figure of nominal expenses on education.

Hostel Costs

No reliable data exist for hostel costs of students. V. N. Kothari assumed, on the basis of item-wise expenditure for the country as a whole, that the yearly cost of living at home was

Rs. 350.00 and that of living in a hostel was Rs. 900.00 so that the additional cost per student who stayed in hostel was Rs 550.00 at the college level. He just halved it to get the comparative school figure. He however observed : "These estimates are not supported by any empirical data but are likely to be accepted as reasonable approximation".¹ We intend to follow a different course.

We assume that as the hostel expenses refer to living expenses, they do not depend upon the type of education, i.e., technical, vocational or general. It appears to us reasonable to assume variations according to the level of education (because of age factors), sex and rural-urban character of the area in which institutions are located. It is difficult to account for the rural-urban differences, in any exact manner, on the basis of data available to us, but we do know that most of the boarders belong to the college level and most of the colleges are in the urban areas.

Our estimates for hostel expenses are based on the Government of India publication, *Facilities for Technical Education in India*. This publication contains information regarding living expenses and hostel expenses at selected places where technical institutions are located. In the case of Punjab this information is available for Jullundur, Ludhiana, Patiala, Phagwara, Amritsar, Chandigarh, Hamirpur and Guru Teg Bahadurgarh. The first six centres are located in urban areas and the last two in rural areas. The information relates roughly to the year 1964-65. Expenses for degree students are naturally higher than expenses for diploma students. Taking the effective period of an academic year as nine months, the annual expenses come out as follows :

1. V.N. Kothari, "Factor Cost of Education in India", *Indian Economic Journal*, April-June 1966.

TABLE 4.12

NORMAL ANNUAL LIVING EXPENSES
(DEGREE COURSES)

(Figures in rupees)

Centre	Annual living expenses outside the hostel	Annual living expenses in the hostel
G. N. Engineering College, Ludhiana	—	450
Thapar Engineering College, Patiala	1080	200—300 plus mess charges
Panjab University Chemical Engineering Department, Chandigarh	900	571.50 (lodging 166 50, boarding 405.00)

Source : *Facilities for Technical Education in India* (1965), Vol. II, Part II, pp. 120-126.

If we take the average round figure per boarder in the hostel, yearly hostel expenses at the college level would be around Rs. 600 00 and yearly expenses for living outside Rs. 1,000.00.

For diploma courses, the normal annual expenses at different centres are given as under :

TABLE 4.13
NORMAL ANNUAL LIVING EXPENSES
(DIPLOMA COURSES)

(Figures in rupees)		
Centre	Annual living expenses outside the hostel	Annual living expenses in the hostel
Guru Teg Bhadurgarh	—	40 plus mess charges
Hamirpur	450	85 plus mess charges
*Jullundur	495 720	108 plus mess charges
*Ludhiana	600 1200	—
Patiala	1080	200 plus mess charges
Phagwara	900	550

* Information refers to two different institutions in the same centre (city)

Source : *Facilities for Technical Education in India* (1965), Vol. I, Part II, pp. 265-277.

We take boarding expenses given for Chandigarh (Table 4.12) as the representative figure and taking an overall average view, our own rough estimate is to take average annual hostel expenses at Rs. 600.00 and for those living outside the hostel this estimate is Rs. 950.00 per student per annum, taking all expenses into account.

We do not have data for students living away from their homes but living at their places of education outside hostels. Our personal enquiries made at a number of educational centres reveal that about one-fourth of the number of potential boarders live outside the hostels for want of hostel accommodation. But such students generally live in small groups to economise on living expenses.

Therefore to the number of residents in attached hostels, we add 25 per cent of the number and calculate the living expenses at the uniform rate of Rs. 600.00 per annum.

To the living expenses may be added the transport expenses from and to the place of residence. Kothari took Rs. 50.00 per student as expense under this head. Punjab being a small state we have assumed Rs. 30.00 on this account. Miscellaneous charges for the year are taken as equivalent to Kothari's estimate of Rs. 150.00. Thus the total hostel expenses add upto Rs. 780.00 per annum per student.

Our estimates are based on boys living in the hostels. It is a known fact that girl students spend less as hostel residents. But how much less? In the *Facilities for Technical Education in India* there is a very helpful hint for Chandigarh centre. At the Central Polytechnic, Chandigarh, living expenses are given as Rs. 80.00 per month; while for the same city in the Government Polytechnic for women, hostel expenses are given as Rs. 50.00 per month. We take this as a representative figure and take hostel expenses for girls as two-thirds of the expenses for the boys. Thus normal hostel expenses for the girls would be Rs. 400.00 and adding the transport and miscellaneous expenses the total hostel expenses for girls come out at Rs. 580.00 per student per annum.

We have to take into account only the additional maintenance expenses of living in the hostels, i.e., over and above the living expenses if the students stayed and studied at their own homes. Thus we need to know the normal living expenses at home. Taking the National Sample Survey 1964-65 (19th round) data as representative, the average monthly per capita expenditure (rural and urban) is Rs. 31.50. For nine months it would come to Rs. 283.50. The additional hostel expenses for boys are Rs. 500.00 and for girls Rs. 300.00 per student in this way. For school-hostel residents we simply halve these figures and get Rs. 250.00 for boys and Rs. 150.00 for girls.

The data about the number of residents in hostels attached to the educational institutes is available with the Department of Education. In the case of boys we increase the figure by one-fourth to include those living outside. The following table gives our estimate in respect of additional maintenance expenses for residents in attached hostels as well as for those living outside :

TABLE 4.14
ESTIMATED ADDITIONAL MAINTENANCE
EXPENSES FOR RESIDENTS IN HOSTELS

(Figures in rupees)

	Number of residents in attached hostels	Estimated number of students living outside	Total number	Additio- nal exp- enditure per student	Total additional expendit- ure
BOYS					
College level	8,350	2,090	10,440	500	52,20,000
School level	3,262	815	4,077	250	10,19,250
TOTAL	11,612	2,905	14,517		62,39,250
GIRLS					
College level	1,692	—	1,692	300	5,07,600
School level	2,726	—	2,726	150	4,08,900
TOTAL	4,418		4,418		9,16,500
GRAND TOTAL					71,55,750

We had calculated our total private and institutional expenditure on education for the year 1964-65 at Rs. 2,193.09 lakhs. Adding the additional hostel expenditure, we get the figure of Rs. 2,264.65 lakhs. This is the total public and private nominal expenditure on education.

Opportunity Costs of Education

Opportunity cost of education is income forgone by students while they devote their time to studies. This is a sort of conjectural income but has significance in explaining some basic issues

in the field of education. When a student joins a particular course of studies, his guardian does in fact think in terms of this cost. It is generally believed that the opportunity cost is not a significant factor at the level of primary education. However, this is not so in the case of Punjab which is predominantly agricultural and has to face labour shortages at intervals. The Economic and Statistical Organisation of Punjab carried out a survey in the rural areas of eight of the state's districts in 1966-67 to evaluate the working of the Punjab Primary Education Act of 1960. According to this survey, 35.2 per cent of boys and 41.7 per cent of girls were not attending the school because of their preoccupation with farm and domestic work and cattle-grazing activity.² It is, therefore, important to calculate the income forgone by the students while they are studying and add it to the total cost of education.

However, one cannot be definite in the case of female students. Many of them are destined to become housewives and the aim of education itself for many of them is not active paid economic work. This may be true of women students in vocational institutions, too, to some extent. An idea can be had from 1961 Census figures. Females constituted only 8.2 per cent of the working population and female workers constituted only 5.5 per cent of the total female population, while the comparative figures for males were 91.8 per cent and 53 per cent respectively. And nearly half of the female workers (52.5 per cent) were employed as agricultural labourers or cultivators, mostly uneducated. 1971 Census shows that the ratio of female workers to total workers has come down to 2.7 per cent while the ratio of female workers to total female population has declined to 1.7 per cent. These figures relate to all female workers, educated and uneducated. Among the educated, the work-participation ratio is likely to be much higher. Nearly 86 per cent of the working women in 1971 were classified as non-agricultural and non-cultivation workers. As 1964-65 is closer to 1961 than to 1971 and the so-called 'Green Revolution' came later, 1961 Census would be a better guide, to the extent that it can serve our purpose. We want to know the proportion of educated females going in for

2. Economic and Statistical Organisation, Government of Punjab, *Report on the Evaluation of the Working of the Punjab Primary Education Act 1960 (Rural Areas)*, p. 61.

paid economic work. We know from census figures that females who have passed an examination equivalent to or higher than the primary standard constitute 26.8 per cent of urban female population, and 5.4 per cent of rural female population that is, a total number of 3,09,272 urban females and 2,14,542 rural females. This gives us a grand total of 5,23,814 females who have passed atleast a primary standard examination. Now the total female working population, according to 1961 Census, is 2.82 lakhs. But under a broad generalisation, we can rule out certain occupations for educated females as given in the occupational distribution of workers. The excluded categories are cultivation of workers, farmers, fishermen, hunters, loggers and related workers, craftsmen, production process workers and unclassified labourers. This leaves a total of 53,101 female jobs for the educated females. This assumption implies that underestimation in one direction will be cancelled out by an overestimation in the other direction. Thus roughly about 10 per cent of educated females can be assumed to have opted for paid economic work in 1961.†

We know from the provisional totals of 1971 Census that the proportion of women workers in non-agricultural and non-cultivation jobs has almost doubled in 10 years. It is therefore reasonable to assume that the proportion of educated women going in for jobs increased by about 50 per cent by 1964-65. Thus it is reasonable to assume that 15 per cent of educated women in 1964-65 went in for paid economic jobs.

The opportunity cost of all male students and 15 per cent of female students has to be added to the total cost of education to arrive at the total real factor cost of education in Punjab. The female participation ratio would be different for different levels of education. But in the absence of relevant data we assume that overestimation and underestimation at different levels would cancel all differences, except that for technical, professional and medical education we assume a 70 per cent ratio.

There is no satisfactory method available to determine opportunity costs of different levels of education. The normal practice is to determine earnings associated with the level of education in question. But the most difficult point is to impute specific earnings to a particular level of education. We have seen in our

†Source : *Fact Book on Manpower 1968, Part I, Table 2.17 and Table 2.42* *Fact Book on Manpower 1969, Part II, Table 5.4.*

review of the theory that it is only under abstract assumptions that we can reach some positive conclusions.

The opportunity costs that we associate with the different levels of education in the state are as under :

TABLE 4.15
OPPORTUNITY COSTS OF EDUCATION

(Figures in rupees)

Level of education	Opportunity costs as earnings of :	Monthly earnings	Annual earnings (1964)
Primary and middle	Unskilled child labourer	12.50	150
Matriculation, higher secondary and pre-university	Peon	50	600
Arts and science graduate	Clerk	100	1,200
Postgraduate	School teacher	150	1,800
Professional and technical diploma	Skilled worker	90	1,080
Vocational school	Unkilled worker	60	720
Medical and technical degree	School teacher	150	1,800

According to the above table the opportunity costs of education in 1964 work out as follows :

TABLE 4.16
CALCULATED OPPORTUNITY COSTS OF
EDUCATION

Level of education	Number of males	Number of females (15 per cent of total, 70 per cent in the case of technical and professional education).	Total number of persons	Total opportunity cost (Lakhs of rupees)
Postgraduate	1,655	72	1,727	31.09
Arts and science graduate	16,054	1,098	17,152	205.82
Professional and medical graduate	6,609	1,315	7,924	142.63
Technical and professional diploma	8,859	4,296	13,155	142.07
Pre-university, higher secondary and matric	4,01,840	30,620	4,32,460	2,594.76
Vocational school	11,526	4,216	15,742	113.34
Primary and middle	6,94,621	67,672	7,62,293	1,143.44
TOTAL				4,373.15

The total opportunity cost of all types of education being imparted comes out at Rs. 4,373.15 lakhs. Adding this to the total nominal cost of education (Rs. 2,264.65 lakhs), it makes a total of Rs. 6,637.80 or roughly Rs. 66.38 crores. The total opportunity cost of Rs. 4,373.15 lakhs should be taken as the upper estimate under the given assumptions. By making the assumptions more rigorous and adjusting for unemployment we can obtain the lower estimate. For the latter we assume that (i) only 10 per cent of educated women in general opt for paid work, (ii) only 50 per cent of women students in professional, technical, medical and vocational courses opt for paid jobs, and (iii) opportunity costs have to be deflated by 20 per cent to account for unemployment among the educated. The distribution of unemployment adjustment over different courses has been done on the basis of distribution of total number of educated applicants with different educational qualifications to the total number of applicants on the live registers of employment exchanges. This distribution as on 31st December, 1964 was as follows :

Matric, higher secondary and F.A.	90 per cent
Engineering and medical graduates	1.2 per cent
Other graduates	7.5 per cent
Postgraduates	1.3 per cent

We shall have to deflate the opportunity costs by 18 per cent, 0.2 per cent, 1.5 per cent and 0.3 per cent respectively for the above categories. The figure of 20 per cent as deflator needs some explanation. It is generally believed that adjustment for unemployment has to be carried out because there is a positive unemployment. We believe that even if there were full employment conditions in the existing structure, we cannot be sure that if all the students had decided to go to work rather than study, they would have gained employment as is assumed in classical economics. The adjustment for unemployment has therefore to be made at a rate exceeding that of the existing unemployment.

According to National Sample Survey data (19th round) for urban Punjab, the unemployed (those seeking work and those not seeking work out available for work) constituted 0.37 per cent of the total population while the labour force constituted 37.82 per cent of the total population in 1964-65. This gives us the figure of unemployed as a percentage of labour force approximately equal to 10 per cent. But National Sample Survey data relate to

unemployment data for persons above 15 years of age and we have to calculate opportunity costs even for primary and middle education levels. In order to account for this we find it reasonable to adopt the deflator as 20 per cent.

The incidence of unemployment was however maximum for matriculate and intermediates in 1964, if live registers of employment exchanges are any guide in this matter. The four categories do not conform to our categories and some adjustment has to be made. The first three categories in our list are similar to the employment exchange data. We distribute figure of 18 per cent pertaining to F.A., higher secondary and matric category into 0.5 per cent each for vocational school level education and for technical/professional diploma level education, 2 per cent for the primary and middle classes and 15 per cent for pre-university, higher secondary and matriculation classes. Thus, accounting for these adjustments, our lower estimate for opportunity cost works out as calculated and presented in Table 4.17.

The lower estimate of the total opportunity cost works out at Rs. 38.38 crores. The total cost of education for the state as a whole comes to Rs. 6,102.45 lakhs according to the lower estimate of opportunity cost. This is in contrast to the previous figure of Rs. 6,637.80 lakhs with the upper estimate of opportunity costs. We can now see that the opportunity cost forms 62.9 per cent of the total costs if we take the lower estimate and 65.8 per cent of the total costs if we take the upper estimate. We shall, however, be using the lower estimate for our purpose.

Excluding the opportunity cost, private expenditure (including additional hostel expenses) on education is 23.2 per cent of total nominal educational expenses. This means that education in Punjab carries a heavy state subsidy, of the order of nearly 77 per cent. However if we include the opportunity cost in the total costs and the private costs, the private costs form 71.5 per cent of the total costs, so that education is still subsidised by the state to the extent of 28.5 per cent. This relates to the situation in 1964-65. Since then the government expenditure has increased at a rapid pace, the increase being 14.56 per cent per annum from 1966-67 to 1971-72. The total institutional expenditure by both the government and the private agencies (direct and indirect expenditure) increased by over 54 per cent from 1964-65 to 1966-67. The per capita government expenditure on education increased

TABLE 4.17
CALCULATED OPPORTUNITY COSTS OF EDUCATION
(LOWER ESTIMATE)

(Figures in lakhs of rupees)

Level of educational	Number of males	Number of females (10 per cent total, 50 per cent in the case of technical and professional education)	Total number of persons	Total opportunity cost	Unemployment adjustment	Net opportunity cost
Post-graduate	1,655	48	1,703	30.65	0.09	30.56
Arts and science graduate	16,054	732	16,786	201.43	3.02	198.41
Professional and medical graduate	6,609	940	7,569	135.88	0.27	135.61
Technical and professional diploma	8,859	3,068	11,927	128.81	0.64	128.17
Pre-university, higher secondary and matric	4,01,840	20,413	4,22,253	2,533.52	380.03	2,153.49
Vocational school	11,526	3,012	14,538	104.67	0.52	104.15
Primary and middle	6,94,621	45,115	7,39,736	1,109.60	22.19	1,087.41
TOTAL				4,244.56	406.76	3,837.80

from Rs. 18.32 to Rs. 26.26 or by 43.34 per cent over six years from 1966-67 to 1971-72. The estimates for private costs of education for the later years are not available but we believe that education is more subsidised today than it was a few year ago.

In 1964-65 the total number of students of both sexes and for all institutes and all classes was 18,13,061 and the number of teachers 52,509. With the total nominal expenditure on education being Rs. 2,264.65 lakhs, the per student cost to the economy was Rs. 124.91. The total private costs, excluding the opportunity costs, were Rs. 526.01 lakhs and therefore the per student private cost was Rs. 29.01. But when we include the opportunity costs, the per student annual cost to the economy becomes Rs. 336.58 and the private cost per student (including opportunity costs) becomes Rs. 240.69.

Can we say some thing about the cost per student in different courses or types of education ? No, if we want to know the total factoral costs, for such data are not available. But direct institutional costs are available for 1964-65 to 1966-67. These are given in Table 4.18 along with the teacher-taught ratio.

The average number of students per teacher is the smallest for the universities and the largest for the primary classes. The explanation is obvious. Universities, besides teaching, specialise in research and the number of seats in most cases is fixed for each class. Most of the newly opened primary schools in the villages are one-teacher schools and they inflate the overall student-teacher ratio for primary education. The per student direct institutional expenditure shows an increase over the years in almost all the cases, the increase being significant in the case of universities, professional colleges and the training colleges. It is almost constant in the case of school education for the first two years but for the year 1966-67, the year of reorganisation of the state, it manifests a significant increase, particularly in the case of primary education. The latter is due to a major drive in the state to expand primary education. Professional and technical colleges also show a considerable increase in the per student cost from 1964-65 to 1965-66. This is probably due to less than full utilisation of the resources, specially fixed equipment and overhead facilities, available. In any case, in terms of expenditure, education shows a clear tangible progress.

TABLE 4.18
AVERAGE ANNUAL COST PER STUDENT
(DIRECT AND INDIRECT COSTS)

	(Figures in rupees)					
	Average annual cost per student			Number of students per teacher		
	1964-65	65-66	66-67	1964-65	65-66	66-67
Universities	6,469	5,523	7,060	9	7	7
Colleges of general education	347	351	329	19	19	19
Colleges of professional and other education (excluding teacher training)	1,160	1,280	1,073	9	9	—
Teacher training colleges (graduates and under-graduates)	210	253	293	20	18	18
High and higher secondary schools	70	76	80	32	31	31
Middle and senior basic schools	53	56	62	32	32	32
Primary schools	33	36	102	42	43	39
Vocational and professional schools	479	434	350	16	13	39

CHAPTER V

ECONOMIC DEVELOPMENT IN PUNJAB

We had some difficulty in defining and measuring the pace of educational progress. There is an equal difficulty in defining and measuring economic development. The latter refers to a change in the structure of an economy such that the economy has an enhanced productive capacity as well as an increased output of goods and services. More specifically, it means that the economy's capacity to produce material output in time period $n+1$ is greater than in time period n and this capacity is being actually utilised. The three major characteristics of the process of economic development are: increase in population, progress of technology resulting in a rise in the productivity per man and accumulation of capital. Kaldor thinks of economic growth in terms of "capitalistic spirit" and "the strength of the entrepreneurial pressures" and he takes these three characteristics as manifestation of growth¹.

The most important single indicator of growth is the continual increase in the output of goods and services. Goods and services are a heterogeneous group — food, furniture, machines, animals, etc. — and the common denominator is the money-price of these in the market. One could take the current price or the constant price index to find out the trend. It is important that the trend is built into the structure of the economy and the increased output is not sporadic, accidental or just weather-influenced. Thus we shall have to supplement the indicator of increase in output by other indicators as we go along. Economic development, particularly when defined in the structural sense, is a long-term process. A one-time change may not sustain itself; some other inherent or exogenous factors may stultify the trend and bring the economy back to its old position.

1. Nicholas Kaldor, *Essays on Economic Stability and Growth*, p. 237

Punjab was reorganised in November 1966. The post-reorganisation period is too short a period of time to analyse the process of growth in its economy. Yet a feel of its changing economy can be had, though it may not be possible to comprehend exactly the pace and the direction in which the economy may eventually move.

Let us start with income and its growth. Fortunately, the income figures for the reorganised Punjab are available from 1960-61 onwards. The latest year for which these figure are available is 1968-69. The base year for our study is 1964-65. Yet economic growth being a long-term process, it would be useful to review the growth of income since 1960-61. The following table gives growth of state domestic product since 1960-61:

TABLE 5.1
NET STATE DOMESTIC PRODUCT

(Figures in crores of rupees)

Year	Net state domestic product (current prices)	Index of net state domestic product (current prices)	Index of net state domestic product (constant prices, base 1960-61)
1960-61	411.07	100.0	100.0
1961-62	441.45	107.4	103.7
1962-63	476.86	116.0	105.4
1963-64	557.26	135.6	112.2
1964-65	689.45	167.7	124.6
1965-66	715.06	174.0	121.7
1966-67	950.86	231.3	130.8
1967-68	1,113.47	270.9	146.6
1968-69	1,236.53	300.8	153.8
(Provisional)			

Source : *State Income of Punjab 1960-61 to 1968-69* (Revised Series), Economic and Statistical Organisation Government of Punjab.

Over the period of eight years the output of goods and services valued at current prices increased by 200.8 per cent. The state income in 1968-69 was three times as large as in 1960-61. However, the growth is not very spectacular when we consider it at constant prices of 1960-61; the increase is just 50 per cent. Let us compare the situation taking 1964-65 as our base. The state income at current prices increased by Rs 547.08 crores or by 79.35 per cent from 1964-65 to 1968-69, giving the average rate of growth of 19.84 per cent. At constant prices, the increase comes only to Rs. 119.85 crores or 23.26 per cent giving the average annual rate of growth of 5.8 per cent. Price increases thus magnify results three to four times.

Net domestic product measures flow of total output over a period of time and is an indicator of the movement of the economy. But from the point of view of economic welfare and distributive justice, i.e., from the point of view of availability of output to people on an average, the per capita concept is more useful. Meier and Baldwin however prefer the total figure to the per capita figure on the plea that the former is the pre-requisite for the latter.² The following table gives per capita income in the state from 1964-65 to 1968-69 :

TABLE 5.2
STATE PER CAPITA INCOME AND NET
DOMESTIC PRODUCT

Year	Net domestic product at current prices (crores of rupees)	Net domestic product at constant prices (base 1960-61) (crores of rupees)	Estimated population	Per capita income	
				at current prices (rupees)	at constant prices (rupees)
1964-65	689.45	512.33	1,18,94,995	580	431
1965-66	715.06	500.15	1,21,21,000	590	413
1966-67	950.86	537.54	1,23,51,299	770	435
1967-68	1,113.47	602.66	1,25,85,974	885	479
1968-69	1,236.53	632.18	1,28,25,108	962	493

2. Meier and Baldwin, *Economic Development*, p. 5

As we have used our own estimates of population, the per capita income figures differ from those given by the Economic and Statistical Organisation, Government of Punjab. Net domestic product at current prices increased by Rs. 547.08 crores or by 79.35 per cent during the five years ending 1968-69. This gives us an average increase of 19.8 per cent per annum. The per capita income figures at constant prices show an increase of 23.39 per cent which gives us an average increase of 5.85 per cent per annum. Although increase in income at current prices is really spectacular, yet increase at constant prices is not insignificant. The major part of increase occurred during the last three years, roughly during the period since reorganisation of the state. 1971 Census reports stability in the growth rate of population in the state. It means that increase in per capita income has been greater than is indicated by the official estimates.

It is not easy to discern whether the stability in the growth rate of population is the outcome of effective family planning measures or is a result of higher incomes of the community. As is well known, the two are mutually causative.

During the period 1966 to 1968 the number of family planning clinics increased by 18 per cent. Sterilisation operations (men and women) were performed on 86,979 persons and the number of I.U.C.D. insertions was 3,43,409. According to the estimates of the Registrar General of India, the population of women in Punjab in the fertility age-group 15-49 was 26,87,900 in 1966 and 31,30,100 in 1971. Taking the average for the period as equal to 29,09,100, it follows that 1,93,420 women were using one of the two major family planning devices. This means one out of every fifteen women. It may be noted that next to Uttar Pradesh and Andhra Pradesh, Punjab shows the lowest decennial growth rate of population during 1961-71. It is conceivable that both family planning programmes and growth of incomes, accompanied by extension of literacy and education have contributed to this. There are good reasons to believe that the present decade may see a significant decline in the growth rate of population in the state.

The progress of technology and accumulation of capital are very important indicators of economic development. The estimates of capital formation and the rate of savings for Punjab are not available for the period relevant to our study. The Central

Statistical Organisation has however worked preliminary estimates of capital formation in India for the period 1960-61 to 1965-66. According to these estimates net domestic capital formation as a proportion of net domestic product at market prices was 12.5 per cent, 12.2 per cent, and 13.4 per cent respectively for the years 1963-64, 1964-65 and 1965-66. Net savings as a proportion of net domestic product at market prices for these years were 10.1 per cent, 9.4 per cent, and 10.9 per cent.² Kishori Lal Jain, on the basis of *ex post* savings being equal to investment, has worked out a savings ratio of 9.4 per cent for Punjab for the year 1967-68; private savings ratio being 8.1 per cent and public savings ratio being 1.3 per cent³. From these estimates it clearly follows that in terms of net investment and capital formation, Punjab is lagging behind. According to Jain's estimates, the total public and private investment in Punjab for the year 1967-68 was Rs. 103.83 crores. The Central Statistical Organisation estimate for net domestic capital formation in the case of India for the year 1965-66 was Rs. 2,442 crores. There is a wide enough gap even if we consider Punjab's net investment as a proportion of total capital formation in the economy. In 1965-66 Punjab's net domestic product was 3.5 per cent of not national product. In 1967-68 it was 4 per cent. Thus Punjab's investment has been very sluggish. According to state sample data of National Sample Survey for Punjab, per capita expenditure in 1964-65 was Rs. 36.54 per month. It rose to Rs. 45.72 per month in 1967-68, an increase of over 25 per cent. As mentioned earlier, per capita income in the state during this period increased by 52.5 per cent at current prices and 16 per cent at constant prices.

In a recent survey of rural markets in Ludhiana district, Hindustan Lever Limited have collected some interesting data. These data pertain to selected, comparatively prosperous and progressive villages with average per capita income of Rs. 1,530 in 1967-68.⁵ The following table based on this study gives percentage figures for the disposal of cash income of four different classes of people. These classes are landless labourers, small

2. Central Statistical Organisation, *Estimates of Capital Formation in India 1960-61 to 1965-66*, p. 13-15.

4. Kishori Lal Jain, *Saving-Investment-Output Analysis of Punjab*, (Mimeographed).

5. Hindustan Lever Limited, *Rural Market in India*.

farmers, medium farmers and large farmers. Small farmers were those who were holding less than 10 acres of land, medium farmers those who were holding 10-20 acres of land and the large farmers who owned more than 20 acres. Average per capita annual income for these four classes was found out to be Rs. 308, Rs. 391, Rs. 1,316, Rs. 2,928 respectively.

TABLE 5.3
DISPOSAL OF CASH INCOME (PERCENTAGES)

Items	Landless labourers	Small farmers	Medium farmers	Large farmers
1. Repayment of debts of which :	4	10	13	2
Farm inputs	.	7	7	2
2. Consumption expenditure of which :	82	63	44	35
Weddings	13	17	8	10
3. Investment and savings of which :	15	27	43	63
Farm inputs	.	15	33	41

Replies to the question on spending hypothetical additional income yielded the following results according to the above-cited study :

TABLE 5.4
PERCENTAGE ALLOCATION OF ADDITIONAL INCOME

Items	Landless labourers	Small farmers	Medium farmers	Large farmers
Food	43	17	9	7
Farms inputs	.	37	52	53
Ornaments and weddings	9	10	12	10
Clothes	11	11	6	6
Durables	12	11	8	10

It is evident from the above tables that investment and savings increase as the level of income increases. The figures are the highest for the highest income-class. What is important to note however is that even among the landless labourers and small farmers the investment and savings are 15 per cent and 27 per cent respectively of their income. Even small farmers with less than 10 acres of land are prepared to spend 37 per cent of their additional income on farm inputs. Further, a major portion of the debt of the farming class relates to farm inputs. However, we cannot say that what holds for the selected prosperous villages of Ludhiana district will also hold for the entire farming sector of the state.

Improvements in technology and methods of production are a far better indicator of growth in the economy and its potentialities. Improved technology expresses itself in an increased productivity per worker.

Between 1961 and 1966 the percentage of iron ploughs to total ploughs in Punjab increased from 47 to 64.4 in the production of sugar and the percentage of power crushers to total crushers increased from 2.1 to 3.5. The number of tractors per 1000 hectares increased from 1.32 to 2.70. The sale of chemical fertilisers increased from 49,162 metric tons in 1961-62 to 2,36,598 metric tons in 1966-67, more than four times. The sale of chemical fertilizers in Punjab more than doubled during 1966-67 to 1968-69. The area under high yielding varieties for four major food crops, namely, wheat, rice, maize and bajra increased by 142 per cent, 32.2 per cent, 80 per cent and 100 per cent respectively during the period 1967-68 to 1969-70. Thus there has been a significant increase in inputs and improvement in techniques. This shows up in increased agricultural output. The index number of agricultural production moved from 128.3 in 1964-65 to 181.8 in 1968-69 (base : triennium ending 1961-62=100).

However, the major gain has been in the case of food crops, whose index of production moved up from 128.9 in 1964-65 to 200.2 in 1968-69. The index of production of non-food crops moved from 126.6 in 1964-65 to 131.8 in 1968-69. The production of oilseeds showed an increase of 8.5 per cent while in the case of fibres there is a noticeable decline of 6 per cent. According to the estimates prepared by the Economic and Statistical Organisation, Government of Punjab, percentage of workers engaged in agriculture to total workers increased from 54.21 in

1966-67 to 55.90 in 1968-69. The Census of 1971 also reveals that the percentage of agricultural workers to total workers has gone up from 55.9 in 1961 to 67.8 in 1971. The contribution of primary sector to total state income was 54.7 per cent in 1965-66 and 62.5 per cent in 1968-69. Thus the growth of the economy is largely based on increased production of food grains and the structure of the economy tilts towards agriculture more sharply today than before. Dependence of workers on agriculture has increased and the growth of agricultural sector is out of pace with the growth of industrial sector.

We have mentioned that the percentage contribution of agriculture to net state domestic product has increased. This increase has meant a decrease in the percentage share of almost all types of secondary and tertiary activities. Large and small scale manufacturing together formed 12.5 per cent of state income in 1965-66 and only 10.2 per cent in 1968-69. The share of the much-talked of small scale manufacturing sector of the state declined from 7.6 per cent in 1965-66 to 6.4 per cent in 1968-69. The share of the secondary sector as a whole came down from 18.0 per cent in 1965-66 to 15.3 per cent in 1968-69 and that of the tertiary sector from 27.3 per cent to 22.7 per cent during the same period.

The industrial sector of the state has remained a very small part of the economy. The number of registered working factories in the state was 3,550 in 1965. It rose to just 3,940 in 1968. The average number of workers employed in the working factories showed an increase of bare 1,762 workers during this period. The main characteristic of the industrial sector is the predominance of the small household industries. Out of the total number of 2,632 factories submitting returns in 1968-69 only 3.4 per cent had an average labour force ranging between 100 and 500 persons. Nearly 70 per cent of them employed less than 20 workers each. There were just five factories employing 2,000 or more workers and not a single factory employed more than 5,000 workers. There is only one large scale industrial project in the public sector in Punjab, namely, Nangal Fertilizers. A recent socio-economic review by the Economic and Statistical Organisation, Government of Punjab, carries the following observation :

In spite of the development of industries, Punjab continues to be primarily an agricultural state as

more than 70 per cent of its population is dependent on agriculture. There is too much pressure on land which results in seasonal as well as chronic under-employment and also low productivity per worker.⁶

Thus we see that although Punjab has shown 5.8 per cent per annum growth rate in real income since 1964-65 and has the highest per capita income, yet most of this progress is based on the phenomenal achievement on the food front. Our progress on this score is really remarkable and Punjab farmers deserve all the credit for accepting new high yielding varieties of seeds and adopting necessary concomitant inputs. Yet from the long-term point of view the structure of the state economy is not well poised for a steady and high rate of growth. A lot more needs to be done to achieve that kind of breakthrough. The heavy dependence of the state on agriculture in terms of output and employment and within agriculture the dependence on food grains production has to be transformed into a balanced economy. The long-term prospects of increasing per acre yield in this field do not appear at all bright. At the same time, every state in India is trying to achieve a measure of comparative self-sufficiency in food grains and the government-supported prices are under heavy pressure. Historically, an industrial revolution is always preceded by an agricultural revolution but agricultural growth has seldom sustained economic growth exclusively on its own. Planning for growth is not a task just for a few years ahead. Our vision should be broad enough to provide for the future. The structural changes necessary for a continuous self-sustained growth are not yet evident in the state. The much publicised 'Green Revolution' is confined only to one major part of the green sector. There is no evidence to show that technology and science have significantly raised the per man productivity in this sector either. Even the official agencies are not sure of that. A shift towards industrial sector is inevitable for economic growth.

The Draft Fourth Plan of the state provided only 6.5 per cent of the total outlay for the industrial sector. In fact as is clear from the following table, the industrial sector never got a share exceeding 7 per cent of the total outlay under planning :

6. Economic and Statistical Organisation, Government of Punjab, *Socio-Economic Review of Punjab 1968-69*, p. 71.

TABLE 5.5
SHARE OF INDUSTRY AND MINING UNDER
PLANNING IN PUNJAB

Period	Expenditure on industry and mining as a percentage of total expenditure
Actual expenditure 1966-67	6.9
Actual expenditure 1967-68	6.0
Plan outlay 1968-69	5.1
Outlay proposed for Draft Fourth Plan	6.5
Actual expenditure 1968-69	4.8
Actual expenditure 1969-70	2.8
Anticipated expenditure 1970-71	3.5
Approved outlay 1971-72	2.3
Fourth Plan outlay (1969-74)	5.5

Source : 1. *Fourth Five-Year Plan* (Draft Outline),
p. 202.

2. *Annual Plan 1970-71* p. 50.

3. *Annual Plan 1971-72* p. 6.

The Fourth Plan outlay for industry and mining is Rs 16.15 crores. The anticipated expenditure until 1970-71 and the approved outlay for 1971-72 add up to Rs. 5.49 crores.⁷ Thus only 34 per cent of the planned outlay would get spent in the first three years of the Plan. Considering this, there is little likelihood that the state would fulfil its target in the field of industrial development and mining.

To sum, the state government has not taken much initiative to invest agricultural surpluses for a balanced development of the economy. At the same time, there is a possibility that the prosperity generated by the agricultural sector may induce increased consumption expenditures, particularly of consumer durables and non-functional items. The existing pattern³ of education in the state provides a clear evidence that education is in demand more as a consumption service and less as an investment category.

7. Government of Punjab, *Annual Plan 1971-72*, p. 6.

CHAPTER VI

PROGRESS OF EDUCATION AND ECONOMIC GROWTH

We have reviewed both the progress of education and economic growth in Punjab. It is time now to put each in the perspective of the other and find out a relation between the two if any.

Let us first give our general conclusions about the progress of education in the state :—

With 33 per cent literacy Punjab ranked 5th among the states of India in 1971. Female literacy grew by 48 per cent during 1961-71, the second highest rate in the country. The increase in literacy has come about mainly through a greater number of female children going to schools now. Enrollment in classes 1-5 increased by 18.5 per cent for females and 13.7 per cent for males during 1966-67 to 1970-71. The percentage of enrollment of boys to their population in the age-group 6-11 increased marginally from 58.67 to 58.80. The total percentage declined from 69.84 to 68.70.

The increased female literacy seems to have resulted from an increased number of female children going to schools now. As the definition of literacy under the census enumeration is broad enough to include anybody (of any age) with three r's. only the new comers to educational fold (adult education or primary education) add to the number of literate persons.

At the primary stage the proportion of school-going children actually attending schools shows a decline in spite of increased total enrollment, the rate of decline being 1.8 per cent annum between 1966-67 and 1970-71. The proportion school-going children actually attending schools at the primary stage in Punjab, in 1970-71 was 68 per cent against the all-India target of 78 per cent for this year. The main reasons for this, as noted earlier, are economic.

The government has tried to expand facilities by opening more schools and providing more teachers but the number of students per teacher has declined. Thus the facilities provided are not being optimally utilised.

At the middle stage, the Government of India target of enrollment was reached in Punjab two years ahead of time. The rate of growth of enrollment at the middle stage as compared to that at the primary stage has been much higher. Thus the number of children opting to continue education is greater than before.

At the high school level too, the annual rate of increase of enrollment has shown an increasing trend. Although the higher secondary school pattern is yielding to the high school pattern, yet the demand for continuing education is increasing.

The college level education in arts and sciences is dominated by private enterprise. Private colleges number five times those managed by the government. Colleges are being opened in an haphazard manner and the expansion of college level education is not tailored to the needs of the economy in any meaningful sense. The decision to open a new college is often based on the whims of politicians and the willingness of prosperous local people to meet the fixed costs. In any case there is an open door policy in the field of higher education as in the case of school education.

The college level education is biased towards general education and within the field of general education towards arts. There are two reasons for this : one, students want to continue education and, secondly, postgraduate facilities are available mostly in the arts faculty. Hence the decision right at the graduate level to go in for that line in which postgraduate facilities are available. 90 per cent postgraduate students belong to the arts faculty.

There is clear evidence that the rate of increase in the number of students at the graduate and the postgraduate levels has been rising faster than at lower levels. Thus the demand for continuing education is positively increasing. Among the states of India the proportion of graduate and postgraduate students to the total number of students is the highest in Punjab. In terms of absolute number too, arts graduates and postgraduates of Punjab outnumber those of many other states which are bigger in size and population and are more developed in terms of school education.

The number of institutes of technical education has been static for several years. The intake capacity at graduate level has

changed very little for engineering but the out-turn of medical graduates has shown a rising trend. In 1967 the out-turn of medical graduates in Punjab per lakh of population was the second highest in the country, next only to Mysore. The actual intake of engineering degree students has declined over the years. The enrollment and out-turn of agricultural graduates have shown an increasing trend.

The school level and diploma level professional and technical education has shown a decline both in terms of intake capacity and out-turn, although the number of institutions has remained constant. The industrial schools for girls which impart training in crafts that can be useful to housewives, have maintained their position in terms of capacity although here too the actual intake is less than the capacity. But the worst affected in terms of decline are diploma courses in engineering where intake as a percentage of even sanctioned reduced strength has shown a declining trend. Thus the system carries a lot of excess capacity and has been responsible for wastefully locking up the community's scarce investible resources.

On the expenditure side, the total expenditure of government on education has shown an increasing trend, though the rate of increase itself has been on the decline. The expenditure on education as a proportion of total revenue expenditure has remained static around 24 per cent.

The per capita expenditure on education has been increasing at the rate of 8.7 per cent year. As a proportion of state income, it has remained static around 2 per cent.

Of the total direct and indirect expenditure on education, higher education has taken one-fifth share from 1964-65 to 1966-67. Within the field of higher education, about 70 per cent is taken up by universities and colleges of general education. Technical and professional colleges absorb less than 30 per cent of the direct expenditure on education and just 6 per cent of the total direct and indirect expenditure on all education. Over three years, 1964-65 to 1966-67, higher technical and professional education has shown a marginal decline in terms of expenditure.

In the field of school education, primary education has shown the highest rate of growth, though in terms of the number of schools the growth is not significant. Expenditure on vocational technical and special schools has declined in absolute figures, in

the rate of growth and even as a percentage of the total direct expenditure on school education as well as of the total (direct and indirect) expenditure on all types of education.

Total indirect expenditure has stayed constant around Rs. 4 crores. The major share is taken up by the expenditure on buildings—nearly 40 per cent of the total. Scholarships and financial concessions to the students take up nearly 27 per cent. Direction and inspection expenses account for 10 per cent of the total indirect expenditure.

The ratio of government to private institutional expenditure (i.e., the exclusive contribution of the private recognised institutes to the total expenditure of all types on all institutes) in 1966-67 was 84 to 16. In 1964-65 the total estimated private expenditure on education was Rs. 5.26 crores. The total, public and private, nominal expenditure on education worked out at Rs. 22.65 crores for the year 1964-65.

The estimated opportunity cost of education in 1964-65 was Rs. 38.38 crores according to the lower estimate based on unemployment adjustment and Rs. 43.73 crores without that adjustment. According to the lower estimate, the grand total of all costs, i.e. expenditure on education for the year 1964-65, was Rs. 61.02 crores. Opportunity costs formed 53 per cent of the total costs.

For the year 1964-65 the private expenditure on education (without taking into account the private institutional expenditure) was 23 per cent of the total costs excluding the opportunity costs and 71 per cent of the total costs if we take these costs into consideration. Perhaps the government is subsidising education to a greater extent now than before.

For the year 1964-65 the per student nominal cost to the economy was Rs. 124.91, the private student cost being Rs. 29.01. These costs are Rs. 336.58 and Rs. 240.69 respectively if we include opportunity costs.

The direct annual institutional costs per student have increased significantly within the span of three years 1964-65 to 1966-67. On an average the per student cost in the universities was Rs. 6,469 for the year 1964-65 and Rs. 7,060 for the year 1966-67. The per student cost in professional, medical and other education rose from Rs. 1,160 in 1964-65 to Rs. 1,280 in 1965-66 but fell to Rs. 1,073 in 1966-67. The

cost per student in vocational and professional schools fell from Rs. 479 in 1964-65 to Rs. 434 in 1965-66 and fell again to Rs. 350 in 1966-67. The decrease in these costs is due to significant increase in the number of students per teacher during the period. The average cost per student in colleges for general education rose from Rs. 347 in 1964-65 to Rs. 351 in 1965-66 and that in teacher training institutes rose from Rs. 210 to Rs. 253 during the same period. In high and higher secondary schools the average annual cost per student rose from Rs. 70 in 1964-65 to Rs. 80 in 1966-67. In middle schools and senior basic schools this cost rose from Rs. 53 to Rs. 62 during the same period. In the case of primary schools the average annual cost per student shows a marked increase from Rs. 33 in 1964-65 to Rs. 102 in 1966-67. Surprisingly, the number of students per teacher does not show much change for these three years. Of course, the number of students per teacher was the lowest in the universities and professional colleges and the highest in the primary schools.

Our review of economic development of Punjab gave us the following broad conclusions :

The net state domestic product in 1968-69 was three times that in 1960-61 at current prices. But at constant prices, it was just 50 per cent more. At constant prices the average annual rate of growth was 5.8 per cent from 1964-65 to 1968-69 and it was 19.8 per cent per annum at current prices for the same period.

The per capita income grew from Rs. 580 in 1964-65 to Rs. 962 in 1968-69 at current prices and from Rs. 431 to Rs. 493 at constant prices. The major increase has occurred since reorganisation.

The high per capita income is due partly to the success of population control measures. One in every 15 women of child-bearing age was using one of the two major family planning devices.

In terms of investment and capital formation Punjab is not doing as well as many other states. A significant part of Punjab's increased incomes is going to consumption expenditure. There is some evidence that the prosperous sections of the farming community are prone to investing a major part of their current incomes within the agricultural sector.

Within the agricultural sector improved techniques and mechanised farming are gaining ground. The index of agricultural production moved from 128.3 in 1964-65 to 181.8 in 1968-69. But the major gain has been in the case of food grains only. The production of non-food crops increased by only 4.1 per cent during this period and the production of fibres actually declined.

The percentage of agricultural workers to total workers has increased over the years. The growth of agriculture is not matched by the growth of industry. The share of secondary and tertiary sectors in the state income has decreased, including even the small-scale industry sector. Within the industrial sector the predominance of small-scale industries continues. In 1968-69 only 3.4 per cent of the factories submitting returns had an average labour force in the range 100-500 persons. (Small factories generally default in the submission of returns.)

The growth of the economy depends largely on the prosperity of its agricultural sector which is not free from risks from the long-run point of view. There is an urgent need to restore balance to the economy by diversifying development. The state plans have always neglected the industrial sector. The potential and actual surpluses of the agricultural sector are not at all being effectively utilised for promoting the long-term savings ratio and for development of the non-agricultural sector.

We shall now examine the extent to which the development of education in Punjab has contributed to the growth of its economy. No quantitative relationship between the two is attempted and we shall limit ourselves to the general inferences that can be drawn from our review of the progress of education and economic growth in the state.

Education in the state has grown in absolute numbers : more students at each level of education. But in a dynamic world, that would hardly be called growth. As a proportion of the population, the growth of numbers has been larger at higher levels of education than at lower levels. Vocational and technical education has definitely lost ground, at higher levels proportionately and at lower levels even absolutely. The overall system that has emerged is highly imbalanced.

Education is related to growth in three ways : (a) it spreads knowledge and adds to the existing stock of knowledge ; (b) it helps in the formation of skills ; and (c) it influences attitudes to life and work. As the growth of the economy has been mainly on the agricultural front, only that education will help economic growth effectively which is related to the spread of knowledge regarding agricultural techniques. In our review of the progress of education we have noted the phenomenal growth in the number of agricultural graduates and postgraduates. Both enrollment and outturn of postgraduates in agriculture increased by more than 50 per cent from 1963-64 to 1967-68. Enrollment in degree classes in agricultural sciences increased very little—from 1,039 in 1964-65 to 1,116 in 1967-68. The out-turn of agricultural graduates however more than doubled, from bare 100 in 1964-65 to 229 in 1967-68. So has been the case in out-turn per lakh of population. As economic growth has been agriculture based and has depended to a large extent on the application of high yielding techniques and seeds per acre of land, the agricultural graduates and the research workers of the Punjab Agricultural University must be given the major share in the progress on agricultural front. The extension services of the University have been very active and the agricultural graduates and postgraduates of this university have helped a great deal to promote and spread knowledge about the improved methods of production. The result has been a marked growth in yield per acre of major food-crops.

But per man productivity in agriculture has not advanced significantly. In fact the percentage of workers in agriculture has increased. Even after marked improvements in agriculture and indications of its great growth potentialities, the agricultural graduates have hardly started taking to farming and cultivation on regular professional basis. Otherwise there would have been a great rush for admission to various agricultural courses and the educational system would have developed in this direction under pressure. Nothing of the kind has happened. Rather, enrollments show a static position if we take 1963-64 as the base and some growth if we take 1964-65 as the base. Had qualified agricultural graduates taken to farming, the swarming uneducated and semi-educated farm managers would have been gradually replaced. Scientific farming has not yet pervaded. Punjab's agriculture and structural changes necessary for long-

term growth are not yet evident.

Postgraduate facilities in agricultural studies are available only at the Punjab Agricultural University, Ludhiana. So far as graduate studies are concerned, in addition to the Punjab Agricultural University, there are two colleges imparting agricultural education. Although the Punjab Agricultural University is the major agency imparting knowledge of agriculture, its share in the total expenditure of the government on education is just 4 per cent. Thus even if agricultural education has made a positive contribution to the growth of the economy of the state, it forms such a small part of the total educational system that the success of this sector cannot be taken for the effectiveness of the system as a whole.

Technical education and skill formation are generally regarded as basic requirements of industrial growth. But the industrial sector of the state is too small a part of the economy, it has grown but little and the government's approach to it has been utterly devoid of imagination and vision. No wonder, the results are not very encouraging and there has been a frustrating increase in the number of unemployed engineers, diploma-holders and institutionally-trained workmen. This has adversely affected the demand for technical and professional education as is evident from the declining ratio of enrollment to intake capacity in the institutes imparting technical and professional education. In many cases the intake capacity has been deliberately reduced to 'solve' the problem of engineering unemployment. The Department of Industries has tried through the media of advertisement, wall-bills and other publicity channels to attract students into these institutes but the fact of excess capacity in technical and engineering education still remains. All this has happened at the time when Indian engineering goods have found export markets and met the international standards. Small industrialists are complaining of non-availability of raw materials and the leaders of industry are blaming the government for inadequate support. The resulting situation is one of over-extended supply of facilities for technical and engineering education. The people of Punjab, in particular those with high skills, are very mobile but the inward looking set-up in every state with a strong preference for local people militates against out-migration. The rate of industrial development in the neighbouring states has also not been very high. The number of applicants in the category of 'professional,

technical and related employees' on the live registers of unemployment exchanges has been 13.9, 20.0 and 26.6 thousands as on 31st December 1967, 1968 and 1969 respectively. The number under this category as a percentage of the total number of applicants for the above period has been 23.7 per cent, 27.7 per cent and 31.3 per cent.¹ The small share of the industrial sector in the state income, its lower than the average rate of growth, the predominance of the small sector where people with high technical qualifications have a limited opportunity of employment, the increasing unemployment among technical people and the increasing proportion of technically unemployed people among the total unemployed people lead us to the obvious conclusion that technical, professional and vocational education in the state has contributed little, if any, to the growth of the economy of the state in recent years. And we should not forget that technical and professional education is a major part of our educational system, particularly in terms of total direct expenditure on it.

There has been a significant growth in general education in terms of institutions, enrollment and teachers as also in financial terms. What has been the impact of this increased education on the development of the state? It is generally expected that an educated worker should be more efficient and productive than a comparatively less-educated or uneducated worker even if the job did not specifically require the kind of education the former has. But this is under the bold assumption that the attitude to work and willingness to work remain the same in the two cases. Although statistical evidence cannot be adduced to refute the assumption, observers of India's educational scene harbour no doubt that the system does not promote these values at all.² An apt description of our system has been given by the Bengal Unemployment Committee :

One great defect of the educational system is that it leads to one end only, namely the M.A., M.Sc., or B.L. examination. It is like a bamboo, each joint being an examination and the diameter remaining practically the same size from the root to very near

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1. *Punjab State Employment Review for 1968-69 and 1969-70*, Government of Punjab.
 2. Gunnar Myrdal, *Asian Drama*, Chapter 31, Section 4.

the top. It has no branches and the crowning top covers a very small area.³

We only wish to add that even after finishing the process of formal education, the educated person operates within a very narrow framework. He is conditioned to adapt himself to an environment that existed earlier when the government required white-collar workers but does not exist any more. A large output of generalists is ill-suited to the requirements of a progressive society. The results have been disastrous. There is a widespread educated unemployment and the backlog has been growing from Plan to Plan, with the government forced at intervals to create unproductive jobs to arrest social discontent. The economy suffers both ways but the loss is greater in the second case where the structure itself is sought to be geared to the educational system.

The structure of education in Punjab is excessively inclined towards general education. This is in contrast to the pattern in many other states. As noted earlier, there is an imbalance in the structure of the economy too, which tilts heavily towards agriculture. A question might be raised, has general education contributed to agricultural prosperity? General education does not teach techniques and skills involved in scientific farming. Nor does our general education induce a person to stay in the village or work on the farms. The swelling ranks of the educated unemployed on the live registers of employment exchanges only proves that educated persons belonging to the rural areas do not want to work on the farms and in the villages. In fact one of the main attractions of education for the rural folk is the escape which the period of education affords from the drudgery of farming and uncivilised life of the villages. The increasing unemployment among educated persons can be read from the following table :

3. Quoted by Ruddar Datt, *Economic Times*, April 18, 1970.

TABLE 6.1
EDUCATED UNEMPLOYMENT IN PUNJAB
(Figures in thousands)

Level of education	Number of persons waiting employment on 31st December, on live registers of employment exchanges					Percentage increase in 1969 over 1965
	1965	1966	1967	1968	1969	
Matric or above but below graduation	14.6	16.6	21.4	25.6	35.3	141.7
Graduate	1.2	1.6	2.3	4.6	7.1	491.6
Postgraduate	0.6	1.1	1.1	1.1	1.4	133.3
TOTAL	16.4	19.3	24.8	31.3	43.8	167.1

The maximum increase in unemployment has been in the case of graduates. In 1969 the number of educated unemployed with qualifications above matriculation on the live registers of employment exchanges was more than 2.5 times that in 1966. It is common experience that whenever a specified number of white-collar job vacancies are notified to the press or the employment exchanges, a certain multiple of this number forms the number of applicants. These are all educated persons demanding jobs which conform to the pattern of education they have received. Actually the type of general education that is imparted in schools and colleges is rarely useful even for white-collar jobs of bank clerks, insurance clerks, government office clerks, despatchers and diarists, postmen, railway ticket examiners, booking clerks, goods clerks, store-keepers and scores of other similar jobs for which the educated aspire. None of these jobs requires the intensive study of the curriculum to which the scholars in our schools and colleges are subjected. Our education is academic in nature. Whatever contribution the educated employees make to the unit that employs them is based largely on the experience they acquire in their jobs. It is entirely feasible to relate the costs incurred in studies and the pay-benefits received when employed. But it is too much to say that benefits result from these costs in any meaningful or functional sense. Thus in terms of knowledge and

skills the general education has contributed very little to economic development in the state.

But has it all been a plain mis-education from the point of view of progress? Perhaps not. There must be some positive gains from the increasing number of students coming out of schools and colleges and staying home for long until they find employment somewhere, preferably away from villages if they belong to rural areas.

The rural sector is proverbially conservative in outlook, methods and attitudes. There was a time when innovation—a new implement, a new method or a new input—was viewed with suspicion and misgivings. Education enlightens and makes people receptive to ideas. That way education helps remove impediments to development. The educated youth may despise manual work but the educated people do exercise a positive influence in shaping the modern outlook and encouraging rational thinking among the rural people. They are to an extent harbingers of change. One can term it as one of the external economies of an otherwise internally inefficient educational system.

The one quality which our educational system does not consciously promote and which is greatly needed for achieving progress is the spirit of adventure and enterprise. The best of our educated people are looking for jobs to fit in and lack the confidence and will to break fresh ground, to set up something on their own, and help the wider cause of overall progress. Every youngman that comes out of the educational system with a tag of general or technical degree seeks a running concern equipped with latest plant, machinery and requires of it a clean job that gives him enough leisure along with a monthly income that is a multiple of the average per capita income of the country. Setting up a unit of his own, howsoever small in size and scale, was neither his aim nor was he ever trained for it by the system.

The system also does not aim at promoting the dignity of labour with the result that a large number of educated people are looking for easy jobs, carrying less responsibility and work and more emoluments and privileges. Even technical personnel would not like to soil their hands and there is an all round preference for sinecure jobs. The extent to which the system corrupts the desire to do manual work can be gauged from the fact that even semi-educated people prefer non-manual work even if it is comparatively less paid.

The National Sample Survey data concerning urban unemployment reveals that only 10 per cent of the unemployed matriculates were willing to accept manual work while 59 per cent were prepared to accept jobs in the salary range of Rs. 50-100 per month rather than engage in manual work and earn more.⁴ It may not be unfair to conclude that general education contributes poorly if at all towards achieving material progress and promoting the right attitude to work. In fact it is misnomer to call the schooling that a modern youth receives as 'education'. "Formal education is a process whereby a person receives ideas and interests, skills and knowledge that he would not receive in his ordinary environment, through the traditional family-community educative influences".⁵ Our educational system comes nowhere near this except perhaps in a non-functional sense that it imparts ideas and interests different from those imparted by the family and the community—to shun work and to grow like a creeper rather than like an upright tree that derives food from the soil by its own efforts.

If we grant the fact that education has not contributed appreciably to economic development, how do we explain its phenomenal growth in recent years. And the process has not been called a halt. The government and the private agencies are engaged alike in speeding up the process still further. We do hear from time to time of plans of restructuring the system but when it comes to actual programming, the suggestions and operations invariably turn to expanding the existing system in one way or the other. Expansion has always got a priority over attempts to change the content. In fact when it comes to allocation of financial resources the choice that is posed is frequently of the type 'more education or less education' and rarely of the type 'this education or that education'.

A major explanation of why an inefficient system has not only been tolerated but promoted lies in the fact that any institution that has lived for a while begins to feed on its own product. An institution of such huge dimensions as education is

4. National Sample Survey, *Report on Preliminary Survey of Urban Unemployment*, Paper Number 8, September 1953.

5. Nicholas Benett, "Primary Education in Rural Communities: An Investment in Ignorance?"—*The Journal of Development Studies*, Special Number, July 1970, p. 95.

bound to create a large number of powerful vested interests. The educational system has certainly widened class and power distinctions. Higher education is expensive and urban in its origin. It is sophisticated, honoured and white-collared in its ends. By prescribing minimum educational qualifications for various jobs, that have little to do with the actual performance of duties, the fences have been erected higher to keep off the poor and low-class people. The rich, privileged and powerful groups have manipulated to usurp high-class clean jobs between themselves in the name of minimum qualifications. The poor have willingly fallen into the trap by offering to receive this expensive and urban higher education for their children, to be told ultimately that jobs are too few for them all. The power game of the elite is a queer game in which the poor are persuaded, encouraged and even helped to run the race and yet near the target they are siphoned off to join the army of unemployed persons. The few who do succeed certainly enjoy the fruit and provide emulation for others. Thus an important reason for expansion of the system is pressure both from upper and lower classes induced by the lure of gainful employment in jobs that are held in high esteem.

Commenting on the minimum-qualification game Arthur Lewis, an authority on development, has argued that a gradual debasement of degrees and diplomas is a natural concomitant of increasing productivity in the system. He cites the cases of England and America. In the former country a university graduate starts with a salary less than that of a miner. In New York City a garbage collector gets \$ 8,000 a year and a university graduate \$ 6,000 a year. His conclusion is : "Yet the way that education raises the productivity of an economy is by employing educated people lower and lower in the hierarchy; or by raising the qualifications required for each job".⁶ We must add a rider that this may not quite happen in an economy which is getting unionised and in which key administrative and political offices are held by the pressure groups. Even if job requirements are progressively raised, there is no guarantee that productivity shall increase too. An excessively qualified person may work with frustration and his ability to work, even if greater, may be more than offset by his reduced willingness-to-work.

6. W. Arthur Lewis, *Some Aspects of Economic Development*, p. 21.

Another reason for continued expansion of our educational system is to be found on the side of supply. The government faced with an election every five years has got to show some positive results. Among the services provided by the government, 'education' and 'health' are items of mass consumption. Expanding a given educational system requires just financial resources. Thus opening of new schools and colleges and expanding facilities available at the existing institutes and upgrading these institutes form the core of government's welfare activities. Local politics invariably help the government in this pursuit. The local politicians can always take credit for opening of new schools and new colleges in their constituencies. The activity is conspicuous; it engages the youth; and fires their imagination for a better and fuller life in the years to come. All of these are immediate gains. The consequences of unemployed educated youth are not faced by the local politicians and are easily transferred to the system which is constantly under attack from the politicians who unwittingly uphold it and from the surging unemployed youth who wish to tear it down.

The demand for expansion of higher education is also induced by inadequate industrialisation and employment opportunities in the system. In many cases higher education is viewed as an alternative to gainful employment. The high incomes associated with the jobs requiring high educational qualifications raise hopes which may be belied later but are very attractive to begin with. At the level of the individual the decision to go in for higher education is not irrational. The individual behaviour is governed by expectations of individual gains. It is another matter that the collective behaviour of individuals produces opposite results.

The structure of education in Punjab is partly explained by the nature of demand for education. The economy's occupational structure is not very diversified. In the absence of a vigorous industry the demand for engineers and technicians is bound to be limited. Similarly a state with no generalised public health scheme will reach the saturation point for its doctors sooner than later. For engineers the disenchantment has already come. The medical men will be faced with it soon. Horizontal growth of the system, unaccompanied by complementary development programmes, is beset with prospects of political and social instability. How else can one explain the widespread discontent among the youth of the country ?

At times demand and supply reinforce each other. New schools and colleges imparting general education are opened only for considerations of prestige. After a certain lag the newly educated graduates clamour for jobs. To accommodate them, more schools and colleges are opened. The system moves from one level of disequilibrium to another in an unending circle.

Whatever the impulses for expansion of education, the system has no functional relationship to economic development. Obviously, the process cannot go on indefinitely and the system is bound to disintegrate. Already it is consuming 45 to 50 per cent of government's development expenditure. Having more of education means having less of roads, factories, houses, irrigation and the like. And there is the mounting unemployment and under-employment staring the policy-makers in the face. Punjab has a strong agricultural base and for a while the agricultural prosperity may provide a cushion and absorb the educated unemployed from rural areas into the family fold. This has already been happening. The graduates operating tractors, harvestors and tubewells is not an uncommon sight in Punjab's villages. But as pointed out earlier, it is not the same thing as saying that they have brought new skills to the rural people. The joint-family system provides a sort of social security system but we should not forget that the joint-family system itself is breaking up and rugged individualism and the nuclear family are coming for sure.⁷

What are the remedies ? For, as the system is, it is neither promoting growth nor contributing effectively to promoting the quality of human resources. Theoretically, we can start from an objective function that education should maximise economic growth or minimise bottlenecks to economic growth and find out how best it can be done. But education is not the only significant variable affecting economic growth nor is it independent of economic growth. In an optimal situation we need a system in which people desire, seek and get that kind of education which is most favourable to their individual and collective progress and has the least-cost mix. Education cannot

7. For further discussion of this point see "Reflections on the Crisis of Economic Development in India", H.K. Manmohan Singh, *The Australian Quarterly*, December 1969.

be wholly functional. For man's fullness, its light-bearing aspect is as important as its fruit-bearing aspect.

Adam Curle has suggested an approach—the complementary positive approach as he calls it—according to which we calculate the types and levels of people that are needed for development and gear the educational growth accordingly.⁸ This requires perspective planning of the rate of growth as well as the pattern and structure of the economy extending over several years. We have not only to plan for students who are development-oriented but also for teachers who have to turn out such students. Such a secular planning does not seem to be feasible. Our own country has not stuck to any clearly defined pattern of future socio-economic system. We started with 'welfare state' and then talked of 'coöperative commonwealth', 'socialist pattern of society' and 'democratic socialism' in that order. The current slogan is establishment of a 'socialist society'. What we mean by it, no one knows. Added to this is the fact that the various states in India have not always toed the line of the Centre. By and large, Punjab has followed the path which is inclined towards feudal supremacy in which the interests of the landed class are fostered and protected.

In the circumstances planning in Punjab has followed a course so aptly described by Adam Curle: "The pupil-teacher ratio was s and s_0 ; therefore x additional teachers would be needed for y additional children; there were b teacher-training institutes providing c teachers every year—these would have to be increased by such and such a proportion; all this would cost so many million rupees".⁹ Punjab seems to have followed this arithmetic approach.

The basic requirement for planning the educational system is to have a firm picture of the socio-economic organisation that it is to serve. One important reason for the success of communist plans is that the future shape of things in communist societies is clearly known and the entire emphasis is on implementation of programmes leading up to well-defined goals. No educational system can be planned independently. In the absence of a clear direction the system will just spread itself. That is what has happened in India.

8. Adam Curle, *Planning for Education in Pakistan* (1966), p. 128.

9. *Ibid.*, p. 140.

The famous Kothari Commission Report (1964-66) has a subtitle: 'Education and National Development'. The very first chapter is devoted to 'Education and National Objectives'. Yet no clear unified picture of the broad society emerges from the reading of this chapter. There is a general discussion of relation of education to national development but no systems approach is in evidence.¹⁰

There is a mistaken feeling among some planners that we can achieve economic growth by merely vocationalising education, i.e., by making education professional, science-oriented and technical. Punjab seems to have acted under this impulse but no concrete results have come out of this policy. The optimism that trained workers, engineers and technicians would of themselves industrialise the state has proven to be altogether misplaced. It is amazing that even the Education Commission lent support to this thesis: "It is less harmful to have some surplus trained personnel on hand for some time rather than hold up the progress of agriculture or industry for lack of such personnel".¹¹

Before we conclude we would like to add that education and physical investments are not mutually exclusive. They are, like other factors of production, complementary to each other. Punjab tried to expand professional and technical education in the state without any complementary programmes of industrialisation. Hence the programmes of education did not fructify. We would also like to add that education and physical capital, though complementary, need not have a fixed coefficient over a given period of time. This coefficient depends on the structure of socio-economic organisation and shall have to be found out for each successive period.

Further, the demand for education does not depend merely on the planned rate of capital formation. The general rise in demand for education depends on many factors, such as, rising incomes and expectations, the demonstration effect, the rising proportion of educated parents, extent of government subsidy and easy availability of educational facilities.

We have already noted that excess capacity either in education or in capital sector is undesirable socially and economically

10. Government of India, *Report of the Education Commission 1964-66*.

11. *Ibid*, p. 93.

unless the excess capacity itself can generate necessary tensions to lift the economy to a higher level of equilibrium as is assumed in Hirschman's model. In our country the pulls and pressures that are generated by the system are political and social rather than economic and have resulted in widespread corruption and inefficiency rather than growth. In Punjab the excess capacity in the educational sector and the sluggish nature of its industrial growth have not induced any automatic in-built linkage effects to take the economy to a higher stage. On the other hand, there is visible social unrest and frustration in addition to rising unemployment among the educated, which are only temporarily mitigated by its agricultural growth. Unless Punjab attempts to balance the growth of its educational system against the growth of its economy, difficulties are bound to increase with the passage of time. Under the present system there are no economic criteria for opening of a new educational institution. The state must draw up its plan for education as an integral part of its overall development model. As things are at present, the system carries not only an overly-extended unproductive activity but a lot of mis-education.

It is widely recognised that progress is not possible without training people in rational modes of thought. Education to be socially purposeful must encourage right attitudes to work. This is different from imparting knowledge of arts and skills. We must distinguish between "training people" and "educating people". The latter includes the former and has a substratum of values and attitudes. There are other social agencies and institutions concerned with values and attitudes but the educational system has the primary responsibility. Basic education and work experience have not commended themselves to our youth so far.

Our system is examination-oriented and does not inspire students to desire work when they leave their studies. Most of them go through the educational mill rather unwillingly to get a degree or a diploma so that they can use it for getting a job. The system does not make its products work-lovers. Changing attitudes through education, so that in place of frustrated youth we have responsible citizens ready to wring out the last drop of their energy for the cause of progress, is the real challenge for the educational leadership.

Gunnar Myrdal has rightly pointed out that corruption in

India's public life is due in a large measure to her relying on discretionary type of controls in managing her economy.¹² Our structure deliberately promotes scarcities and controls, enabling anyone holding quotas and permits to make easy money. Much of the ill-gotten money circulating in the economy—the black money phenomenon—is on this account. Wage differentials reflect colonial values rather than productivity differentials. Job performance is no consideration except perhaps in the organised private sector. The general prevalence of job security, promoted through government regulations and trade unionism, has kept professional conduct and discipline in a low key.

What is needed to redeem the situation is a total social action and not just reorientation of the educational system. That raises a question which transcends the scope of this study. However, the minimum that can be said is that the system should actively locate points which can radiate forces of growth and concentrate its efforts and expenditure on those points. The scope of educational activity too needs to be enlarged. For example, apart from formal education, the system must deliberately engage in functional adult education. By this we mean reaching useful knowledge to people who are employed (self-employed or hired) but are neither properly educated nor properly skilled. This would entail acquainting workers with the new techniques of trade, agriculture, manufacture, transport and commerce. This type of education has so far been made available only in agriculture, excepting minor programmes of training here and there. It is of paramount importance that industry, trade, services and other sectors of the economy are covered by this type of education. Keeping of trade accounts, mastering tractor mechanics, operating sophisticated machines, learning about new sources of raw materials or new markets, knowing government regulations and procedures, etc., are as important as propagation of seeds and application of fertilizers. It is remarkable that while All India Radio has introduced programmes for better agriculture, it has no programmes to help shopkeepers, traders, manufactures and office-hands! Functional adult education, whether it is imparted through the organised educational sector or other publicity media, has great potentialities which must be tapped.

Similarly a programme of refresher courses, training

12. Gunnar Myrdal, *op. cit.*, Chapter 20, pp. 937–59.

programmes and reorientation courses for those who are employed and those who are unemployed but are seeking employment can be very helpful : it can help formation of skills and at the same time lead to utilisation of some excess capacity in the system. These courses should be of short-term duration and of applied nature and should be conducted at the points where there is concentration of demand, such as, at important centres and places with pools of unemployed persons.

We would also urge that further linear expansion of the educational system should be frozen except in the case of primary education. Development funds have a very high opportunity cost. People have a right to education but not to education that leads to a dead end. It is not realized that unemployed youth is often a menace to society rather than a source of productive activity. It does not even constitute a force actively seeking a revolution in favour of a more progressive society. Commenting on India's educational system, an Indian economist has the following to say :

I have no doubt in my mind that if India's educational system does not grow into an 'instrument of social, economic and cultural transformation necessary for the realization of national goals', India's democratic planning will go down in her history as a still-born experiment.¹³

13. H.K. Manmohan Singh, *op. cit.*, p. 73.

A Selected Bibliography

[It includes works consulted but not cited in the text.]

- Adisesiah, Malcolm S. "Unemployment of Engineers in India". *Impact of Science on Society*, January-March 1969.
- Anderson, C. A. and Mary Jean Bowman, eds. *Education and Economic Development*. London : Frank Cass, 1966.
- Aukrust, Odd, "Investment and Economic Growth". *Productivity Measurement Review*, February 1959.
- Baljit Singh, ed. *Education as Investment*. Meerut : Meenakshi Prakashan, 1967.
- Balogh, Thomas. "Comments on the Paper by Messrs Tinbergen and Bos". In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964.
- . *The Economics of Poverty*. London Weidenfeld and Nicolson, 1966.
- Becker, Gary S. *Human Capital*. New York : National Bureau of Economic Research, 1964.
- Beckerman, W. *Planning Education for Economic and Social Development*. Paris : O.E.C.D., 1963.
- Benson, Charles S., ed. *Perspectives on the Economics of Education*. Boston : Houghton Mifflin Company, 1963.
- Bennet, Nicholas. "Primary Education in Rural Communities : An Investment in Ignorance ?" *The Journal of Development Studies*, July 1970.
- Blaug, M. "The Rate of Return on Investment in Education in Great Britain". *The Manchester School*, September 1965.
- . "Approaches to Educational Planning". *Economic Journal*, June 1967.

- , ed. *Economics of Education 1*. Harmondsworth : Penguin Books, 1968.
- , ed. *Economics of Education 2*. Harmondsworth : Penguin Books, 1969.
- , Richard Layard and Maureen Woodhall. *The Causes of Graduate Unemployment in India*. London : Allen Lane The Penguin Press, 1969.
- Blot, Daniel and Michel Debeauvais. "Educational Expenditures in Developing Areas : Some Statistical Aspects". In *Financing of Education for Economic Growth*. Paris : O.E.C.D., 1966.
- Bowman, Mary Jean. Review of *Education, Manpower and Economic Growth* by Frederick Harbison and Charles A. Myers. *The Journal of Political Economy*, June 1965.
- , and C. Arnold Anderson. "The Role of Education in Development". In *Development of the Emerging Countries*. Washington, D.C. : The Brookings Institution, 1962.
- Bowen, W.G. "Assessing the Economic Contribution of Education : an Appraisal of Alternative Approaches". In *Higher Education. Report of the Committee under the Chairmanship of Lord Robbins, 1961-63. Appendix Four*. London : H.M.S.O., 1963.
- Census of India. *Paper 1 of 1971 (Punjab)*. Chandigarh : Government Press, 1971.
- *Supplement to Paper 1 of 1971 (Punjab)*. Chandigarh : Government Press, 1971.
- Clark, David A. and Pang Eng Fang. "Return to Schooling and Training in Singapore". *The Malayan Economic Review*. October 1970.
- Coombs, Philips H. *What is Educational Planning ?* UNESCO : International Institute for Educational Planning, 1970.
- Correa, H. *Economics of Human Resources*. Amsterdam : North Holland Publishing Company, 1963.
- , and Jan Tinbergen. "Quantitative Adaptation of Education to Accelerated Growth". *Kyklos*, Vol. XV No. 4, 1962.

Curle, Adam. *Planning for Education in Pakistan*. London : Tavistock Publications, 1966.

Datt, Ruddar. "Unemployment and Manpower Utilisation". *Economic Times*, Bombay, 18 April, 1970.

Denison, Edward F. "Measuring the Contribution of Education (and the Residual) to Economic Growth". In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964.

———, and J. P. Poullier. *Why Growth Rates Differ*. Washington, D.C. : The brookings Institution, 1968.

Domar, E. "On the Measurement of Technological Change". *Economic Journal*, December 1961.

Government of India. Ministry of Education. *The Indian Year Book of Education—Elementary Education*. Delhi, 1964.

———, *Facilities for Technical Education in India*. 2 vols. Delhi, 1965.

Government of India. Education Commission. *Report of the Education Commission 1964-66*. Delhi, 1966.

Government of India. Central Statistical Organisation. *Estimates of Capital Formation in India 1960-61 to 1965-66*. Delhi, 1970.

Government of India. Planning Commission. *Report of the Study Group on Educated Unemployed*. New Delhi, 1956.

Government of India. *Annual Plan 1969-70*.

Government of Punjab. Planning Department. *Draft Outline. Fourth Five-Year Plan*. Chandigarh, 1968.

——— *Fact Book on Manpower 1968*. Part I. Chandigarh, 1968.

———. *Fact Book on Manpower 1969*. Part II and Part III. Chandigarh, 1969.

———. *Annual Plan 1967-68. Progress Report*. Chandigarh, 1969.

———. *Annual Plan 1969-70. Punjab State*. Chandigarh, 1970.

———. *Annual Plan 1970-71*. Chandigarh.

———. *Annual Plan 1971-72*. Chandigarh, 1971.

Government of Punjab. The Economic and Statistical Organisation. *Statistical Abstract of Punjab* for 1965, 1966, 1967, 1968, 1969, 1970 and 1971.

———. *Report on the Evaluation of the Working of the Punjab Primary Education Act 1960 (Rural Areas)*. 1966-67. Mimeographed.

———. *Report on the Analysis of Administrative Data Regarding Agriculture, Education, Health and Roads*. Publication No. 69. Chandigarh, 1967.

———. *Socio-Economic Review of Punjab 1968-69* Chandigarh, 1970.

———. *State Income of Punjab 1960-61 to 1968-69. (Revised Series)*. Chandigarh, 1970.

Government of Punjab. Directorate of Employment, *Punjab State Employment Review* for the years 1968-69 and 1969-70.

Haag, Ernest Van Den. *Education as an Industry*. New York : Augustus M. Kelley, 1956.

Halsey, A.H., Jean Floud and C. Arnold Anderson. *Education, Economy and Society*. New York : The Free Press, 1969.

Hansen, W.L. "Total and Private Rates of Return to Investment in Schooling". *Journal of Political Economy*, April 1963.

Harberger, A.C. "Investment in Men versus Investment in Machines : the Case of India". In *Education and Economic Development* edited by C. A. Anderson and M. J. Bowman. London : Frank Cass, 1966.

Harbison, Fredrick and Charles A. Myers. *Education, Manpower, and Economic Growth*. Calcutta : Oxford and IBH Publishing Co., 1968.

Harris, Semour E. *Economic Aspects of Higher Education*. Paris : O.E.C.D., 1964.

Hindustan Lever Ltd. *Rural Market in India*. Bombay, 1969.

Hone, Angus. "Economics of Improving Technical Education". *Economic and Political Weekly*, January 1968 (Annual Number).

———. "What Kind of Manpower Planning ?" *Economic and Political Weekly*, July 27, 1968.

- Huq, Muhammad Shamsul. *Education and Development Strategy in South and Southeast Asia* Honolulu : East-West Center Press, 1965.
- Hussain, I.Z. "Returns to Education in India : An Estimate". In *Education as Investment* edited by Baljit Singh. Meerut : Meenakshi Prakashan, 1967.
- Indian Institute of Economics. *A Socio-Economic Survey of Hyderabad*. Hyderabad : Government of India Press, 1957.
- Institute of Applied Manpower Research. *Fact Book on Manpower Part I*. New Delhi, 1968.
- . *Demand for Doctors for Fourth and Fifth Plan Periods*. New Delhi, 1970.
- Ito, Ryoji. "Education as a Basic Factor in Japan's Economic Growth". *The Developing Economies*, January-June 1963.
- Jain, K. L. *Saving-Investment-Output Analysis of Punjab*. Patiala : Punjabi University, Punjab Economy Research Unit, 1971. Mimeographed.
- Jha, L K. "Education and Economic Development". *Reserve Bank of India Bulletin*, April 1970.
- Johnson, Harry G. "Comments on Mr. John Vaizey's Paper". In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964.
- Johns, Roe L. and Edgar L. Morphet. *The Economics and Financing of Education. A Systems Approach*. Englewood Cliffs : Prentice-Hall, 1969.
- Jorgenson, D. W. and Z. Griliches. "The Explanation of Productivity Change", *Review of Economic Studies*, Vol. XXIV, No. 3, 1967.
- Kaldor, Nicolas. *Essays on Economic Stability and Growth*. London : Genrald Duckworth and Co., 1960.
- . "Comments on Mr Ingvar Svennilson's Paper". In *The Residual Factor and Economic Growth*. Paris : O. E. C. D., 1964.

- Kenderick, J. W. *Productivity Trends in the United States*. Princeton : Princeton University Press, 1961.
- Keynes, John Maynard. *Essays in Pursuation*. New York : W.W. Norton and Company, 1963.
- Khusro A. M. *A Survey of Living and Working Conditions of Students of the University of Delhi*. Bombay : Asia Publishing House, 1967.
- Kikar, B. F. "The Historical Roots of the Concept of Human Capital." *Journal of Political Economy*, October 1966.
- . "Von Thunen on Human Capital". *Oxford Economic Papers (New Series)*, November 1969.
- Kothari, V. N. "Factor Cost of Education in India". *Indian Economic Journal*, April-June 1966.
- . "Returns to Education in India". In *Education as Investment* edited by Baljit Singh. Meerut : Meenakshi Prakashan, 1967.
- Lewis, W. Arthur. *Some Aspects of Economic Development*. London : George Allen and Unwin, 1969.
- Machlup, Fritz. *The Production and Distribution of Knowledge in the United States*. Princeton : Princeton University Press, 1962.
- Manmohan Singh, H.K. "Reflections on the Crisis of Economic Development in India". *The Australian Quarterly*, December 1969.
- Marshall, Alfred. *Principles of Economics*. London : Macmillan and Co., 1949.
- Masell, B. F. "Capital Formation and Technological Change in United States Manufacturing". *Review of Economics and Statistics*, 1960.
- Meier, Richard L. *Developmental Planning*. New York : McGraw Hill Book Company, 1965.
- Merrit, Stephen. "The Rate of Return to Education : A Critique". *Oxford Economics Paper (New Series)*, November 1966.
- Miller, Herman P. "Annual and Lifetime Income in Relation to Education : 1939-1959". *American Economic Review*, December 1960.

- Mishra, Vikas. *Hinduism and Economic Growth*. Bombay : Oxford University Press, 1962.
- Morgan, James N., et. al. *Income and Welfare in the United States*. New York : McGraw Hill Book Company, 1962.
- Mukerji, K. and N. Krishnarao. "Education and Economic Development in India, 1951-1961". In *Education as Investment* edited by Baljit Singh. Meerut : Meenakshi Prakashan, 1967.
- Musgrave, Richard A. "Notes on Educational Investment in Developing Nations". In *Financing of Education for Economic Growth*. Paris : O.E.C.D., 1966.
- Myrdal, Gunnar. *Asian Drama*. 3 vols. New York : Pantheon Books, 1968.
- . *The Challenge of World Poverty*. London : Allen Lane The Penguin Press, 1970.
- Nalla Gounden, A. M. "Education and Economic Development". Ph. D. dissertation, Kurukshetra University, Kurukshetra, 1965.
- National Sample Survey. *Report on Preliminary Survey of Urban Unemployment*. Paper No. 8. Delhi, 1953.
- O.E.C.D. *Policy Conference on Economic Growth and Investment in Education*. Paris, 1962.
- . *The Residual Factor and Economic Growth*. Paris, 1964.
- . *Lectures and Methodological Essays on Educational Planning*. Paris, 1966.
- . *Financing of Education for Economic Growth*. Paris, 1966.
- . *Social Objectives in Educational Planning*. Paris, 1967.
- Panchmukhi, P. R. "Educational Capital in India". *Indian Economic Journal*. January-March 1965.
- Pandit, H. N. "Economic Approaches to Investment Decision-making in Education". *Indian Educational Review*, January 1970.

- Parnes, H. *Forecasting Educational Needs for Social and Economic Development*. Paris : O.E.C.D., 1962.
- Raj, K. N. "Crisis of Higher Education in India". December, 1970. Mimeographed.
- Rogers, D. C. "Private Rates of Return to Education in the United State A—Case Study". *Yale Economic Essays*, Spring 1969.
- Rowley, C. K. "The Political Economy of British Education". *Scottish Journal of Political Economy*, June 1969.
- Sandee, J. "Comments on Mr. Edward F. Denison's Paper". In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964.
- Schultz, Theodore W. *The Economic Value of Education*. New York : Columbia University Press, 1963.
- . "Capital Formation by Education". *Journal of Political Economy*, December 1960.
- . "Investment in Human Capital : Reply". *American Economic Review*, December 1961.
- Shaffer, H. G. "A Critique of the Concept of Human Capital". In *Economics of Education 1* edited by M. Blaug. Harmondsworth : Penguin Books, 1968.
- Singer, H. W. *International Development : Growth and Change*. New York : McGraw-Hill Book Company, 1964.
- Solow, R. M. "The Technical Change and Aggregate Production Function". *Review of Economics and Statistics*, August 1957.
- Svennilson, Ingvar., F. Edding and L. Elvin. "Targets for Education in Europe in 1970". In *Policy Conference on Economic Growth and Investment in Education*. Paris : O.E.C.D., 1962.
- Tinbergen, Jan and H. C. Bos. "A Planning Model for the Educational Requirements of Economic Development". In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964,

UNESCO. *Manpower Aspects of Educational Planning*. Paris, 1968.

———. *Readings in the Economics of Education*. Paris, 1968.

Vaizey, John. *The Economics of Education*. London : Faber and Faber, 1962.

———. “Towards a New Political Economy ?” In *The Residual Factor and Economic Growth*. Paris : O.E.C.D., 1964.

Weisbrod, B.A. “Education and Investment in Human Capital”, *Journal of Political Economy*, October 1962.

———. *External Benefits of Public Education—An Economic Analysis*. New Jersey : Princeton Industrial Relations Center, 1964.

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